African Invertebrates Vol. 44 (2) Pages 000–000 Pietermaritzburg December, 2003

# *Margdalops*, a new African genus of Anthomyzidae (Diptera), comprising six new species

by

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## ABSTRACT

*Margdalops* gen. n. (type species: *M. venustus* sp. n.) is described for six new African species of Anthomyzidae. The new genus is diagnosed and its relationships are discussed—it is regarded as the sister-group of the genus *Amygdalops* Lamb, 1914. Six new species of *Margdalops* are described, keyed, illustrated and grouped into two monophyletic clades, viz. the *M. angustus*-group [*M. microcercus* sp. n. (Kenya, Uganda), *M. angustus* sp. n. (South Africa), *M. signatus* sp. n. (Kenya)] and the *M. venustus*-group [*M. venustus* sp. n. (South Africa), *M. bifilum* sp. n. (Kenya), *M. caligatus* sp. n. (Kenya)]. The relationships of species are discussed and the known distribution of *Margdalops* is reviewed. Little is known about the biology of *Margdalops*, but larvae of *M. venustus* have been reared from the nests of the Cape Robin, *Cossypha caffra*, and may develop as saprophages in plant material used by these birds to construct their nests.

## INTRODUCTION

The African fauna of the family Anthomyzidae is largely unknown; there is considerable generic and species diversity on the continent, but only a small portion of it has been treated taxonomically (cf. Roháček 1993 1998, in press). Prior to this study only two genera were recorded from Africa, namely *Amygdalops* Lamb, 1914 (one species) and *Barbarista* Roháček, 1993 (five species).

Among several unnamed genera we recognised one which proved to be related to *Amygdalops*. Because the afrotropical species of the latter genus are the subject of a recent study (Roháček, in press), it was possible to compare both these groups in detail, evaluate the degree of their relationships, and refine their taxonomic limits. At least nine species of the new genus *Margdalops* have been recognised, but only six are described here, as the remaining three are represented by insufficent material. Therefore, additional African species of *Margdalops* will certainly be described in future when further material is acquired.

## MATERIAL AND METHODS

The material examined during this study is deposited in the following collections: AMSA – Australian Museum, Sydney, Australia; BMNH – The Natural History Museum (formerly British Museum of Natural History), London, England, UK; NMSA – Natal Museum, Pietermaritzburg, South Africa; NMWC – National Museum of Wales, Cardiff, Wales, UK; SMOC – Silesian Museum, Opava, Czech Republic; TAUI – National Collection of Insects, Department of Zoology, Tel Aviv University, Tel Aviv, Israel.

The presentation of label data is strictly verbatim for holotype specimens, but standardised for other material examined. Abdomens of most specimens were detached and genitalia dissected. After examination, all dissected parts were placed in plastic tubes containing glycerine, and pinned below the respective specimens; this is indicated by the abbreviation 'genit. prep.' in the text.

The genus *Margdalops* is diagnosed using the sequence of characters listed by Roháček (1999*b*). Only the type species, *M. venustus* sp. n., is described in detail; descriptions of other species are abbreviated, listing only character states differing from those of the type species, or those described in the generic diagnosis. Morphological terminology follows that of Roháček (1998 1999*a*), including terms used to describe the male hypopygium. The 'hinge' hypothesis for the origin of the eremoneuran hypopygium, rediscovered and documented by Zatwarnicki (1996), has been accepted and, therefore, the following alterations of terms of the male genitalia need to be listed (new term first): ejacapodeme = ejaculatory apodeme, epandrium = periandrium, medandrium = intraperiandrial sclerite, phallapodeme = aedeagal apodeme, transandrium = posterior hypandrial bridge. Morphological characters of the male genitalia are shown in Figs 36–41, and of the female postabdomen and genitalia in Figs 43–47.

Abbreviations of morphological terms used in the text and/or figures:

$A_1$ - anal vein
ac - acrostichal (seta)
afa - aedeagal part of folding apparatus
ag - accessory gland
bm - basal membrane
C - costa
ce - cercus
cp - caudal process of transandrium
cs - connecting sclerite
$Cs_3$, $Cs_4$ - 3rd, 4th costal section
$CuA_1$ - cubitus
dc - dorsocentral (seta)
dm - discal medial cell
dm-cu - discal medial-cubital (= posterior, $t_p$) cross-vein
ea - ejacapodeme
ep - epandrium
f - filum of distiphallus
$f_1$, $f_2$, $f_3$ - fore, mid, hind femur
fc - fulcrum of phallapodeme
gs - gonostylus
hl - hypandrial lobe
hu - humeral (= postpronotal) (seta)
hy - hypandrium
is - internal sclerite(s)
M - media
ma - medandrium
npl - notopleural (seta)
oc - ocellar (seta)
ors - orbital (seta)
pa - postalar (seta)
pg - postgonite
pha - phallapodeme
pp - phallophore
ppl - propleural (= proepisternal) (seta)
prg - pregonite
prs - presutural (seta)
pvt - postvertical (seta)
$R_1$ - 1st branch of radius
$R_{2+3}$ - 2nd branch of radius
$R_{4+5}$ - 3rd branch of radius
r-m - radial-medial (= anterior, $t_a$) cross-vein
s - saccus of distiphallus
S2–S10 - abdominal sterna
sa - supraalar (seta)
sc - scutellar (seta)
Sc - subcosta
sp - spermatheca
stpl - sternopleural (= katepisternal) (seta)
T1–T10 - abdominal terga
$t_1$, $t_2$, $t_3$ - fore, mid, hind tibia
ta - transandrium
vi - vibrissa
vr - ventral receptacle
vte - outer vertical (seta)
vti - inner vertical (seta)

## **Margdalops** gen. n.

Type species: *Margdalops venustus* sp. n., by present designation.

Etymology: The name is an abbreviated conjunction of '*Marg*[o + Amyg]*dalops*' and is derived from dark brown margin of the wing (margo = Lat. margin). Gender masculine.

Description:

(1) *Head* (Figs 42, 48): As long as or slightly longer than high. (2) Eye large, convex, ovoid, with longest diameter oblique. (3) Occiput strongly concave. (4) Occiput (and often also frons) with a pair of medial silvery white microtomentose stripes. (5) Frons very narrow; frontal triangle long, narrow and microtomentose (only ocellar triangle bare, shining). (6) Frontal lunule small but distinct. (7) Antenna geniculate between pedicel and 1st flagellomere; pedicel overlapping base of 1st flagellomere. (8) Arista long ciliate, never pectinate (Figs 42, 48). (9) Palpus slender, with 1 distinct subapical seta. Cephalic chaetotaxy: (10) pvt short but crossed or strongly convergent; (11) vte longest of cephalic setae (vti, oc, and posterior ors often of same length); (12) vti as long as or slightly shorter than vte; (13) 2 long ors, the posterior in the middle of orbit, the anterior close to fore margin of frons, plus 2 microsetulae just in front of anterior ors; (14) a single row of minute postocular setulae; (15) 1 long vi and 1–2 shorter subvibrissae; (16) peristomal setulae few in number, about twice as long as postoculars.

(17) *Thorax* (Fig. 42): Distinctly narrower than head. (18) Pleura with dark, longitudinal band at dorsal margin or entirely brown. Thoracic chaetotaxy: (19) 1 hu, 2 npl (anterior longer); (20) 1 short sa, 1 longer pa; (21) 1 distinct prs, longer than in *Amygdalops*; (22) 2 postsutural dc, the anterior long and inserted in the middle between suture and posterior dc; (23) ac microsetae in 4 rows in front of suture, in 2 rows or absent behind anterior dc; (24) 2 sc, the apical long, the laterobasal small; (25) 1 minute ppl; (26) 2 stpl, the anterior shorter and weaker. Legs: (27) Fore leg always unicolorous, yellow; (28) $f_1$ without ctenidial spine; (29) $t_2$ with distinct ventroapical seta; (30) male (rarely also female) $f_3$ with posteroventral row of setae, with those in apical third shortened and thickened (Fig. 65). (31) Wing (Figs 66–71) long and very narrow; (32) wing membrane with dark brown band along anterior margin; (33) C without thick spinulae; (34) $R_{2+3}$ long, sinuate, close to C and ending more than twice further from apex of $R_{4+5}$ than M; (35) $R_{4+5}$ slightly sinuate to almost straight; (36) $R_{4+5}$ and M slightly to distinctly convergent apically; (37) M straight or very slightly bent; (38) discal (dm) cell short and very narrow, with cross-vein r-m situated near or anterior to its middle; (39) $CuA_1$ relatively long, almost reaching wing margin; (40) $A_1$ and anal lobe reduced, anal (cup) cell very narrow; (41) alula small and very narrow, dark brown.

*Male abdomen*: (42) T1 separate from T2, at least dorsally; (43) T2–T5 large and broad, uniformly dark brown. (44) S1–S5 much narrower, at most slightly paler than terga. Male postabdomen: (45) T6 small, transverse, weakly sclerotised; (46) S6-S8 fused dorsolaterally; (47) S6 strongly asymmetrical and its ventral part very shortened; (48) S7 asymmetrical, placed laterally; (49) S8 relatively long, less asymmetrical and situated dorsally.

*Male genitalia* (Figs 13–18, 36–41): (50) Epandrium moderately to very broad; setosity variable, usually dorsomedial (often also ventrocaudal) seta longest. (51) Medandrium usually wide and medially shortened (low); (52) cercus heavily sclerotised and usually enlarged. (53) Gonostylus variable, with longest setae in anterior half of inner side, micropubescence on outer side usually developed. (54) Hypandrium simple, with internal lobes reduced; (55) transandrium (Fig. 15) simple, without caudal process, only lateral sides of basal membrane weakly sclerotised. (56) Pregonite fused to hypandrium and incurved, at most with small tubercle in posterior part (Figs 16, 41), with 2 groups of setae. (57) Postgonite simple and slender, more or less flattened; sometimes with small basal sclerite attached to its proximal part (Fig. 3). (58) Aedeagal part of folding apparatus (Fig. 39) dorsally membranous, laterally provided with lenticular tubercles or spines; its outer wall (attached to postgonite) striated; (59) connecting sclerite (Figs 2, 39) pale to dark pigmented. (60) Basal membrane medially with small transverse tubercles or spinulae, laterally weakly sclerotised. (61) Phallapodeme with distinctly (sometimes asymmetrically) bifurcate base. (62) Aedeagus with short, frame-like phallophore and (63) distiphallus composed of voluminous membranous saccus and slender sclerotised filum. (64) Saccus reinforced by a pair of basal sclerites and its membrane armed by various spines, setae or tubercles; (65) filum formed by 2 dark, slender band-like sclerites, in more advanced taxa largely fused and with various teeth and processes. (66) Ejacapodeme small to medium-sized, with slender digitiform projection.

(67) *Female abdomen*: With broader terga (T2–T6) and narrower sterna (S2–S5). (68) Postabdomen (Figs 43, 47) relatively short, broad and well sclerotised; (69) T6 and S6 relatively large. (70) T7 laterally somewhat extended, rarely reaching ventral side and enclosing spiracles; (71) S7 slightly modified, usually simple, dark pigmented; (72) T8 plate-shaped, transverse, with rounded posterior corners; (73) S8 small, slightly protruding posteromedially, with a narrow, posteromedial incision. (74) Internal sclerotisation of genital chamber (uterus) well developed (Figs 44, 46), formed by 1–3 pairs of posterior crooked sclerites and (75) 1 ventral ring-shaped sclerite being twisted and tenuous in some specimens. (76) Anterior part of uterus with membranous or weakly sclerotised cup-like to flask-shaped ventral receptacle (Figs 22, 46) with a digitiform or vermicular terminal projection. (77) Accessory gland of usual form, on subterminally dilated and ringed duct. (78) Spermathecae (1+1) spherical or nearly so (Figs 32, 45), with distinct cervix, and body surface near duct insertion carrying very small tubercles or spinulae with stalked microglobules. (79) T10 small, at least partly dark, with 1 pair of dorsal setae and some micropubescence; (80) S10 usually wider and longer than T10, simple, densely micropubescent and with posterior row of setulae. (81) Cercus short and broad, with short but profuse setae.

Discussion: *Margdalops* gen.n. is best diagnosed by the combination of the character states 2–4, 6, 8, 12, 13, 18, 21, 22, 28, 30, 32, 38–41, 51, 52, 54–56, 58, 60, 70, 71, 73, 76, 78 and 81. However, some of these features are shared synapomorphies with the genus *Amygdalops* Lamb, 1914, demonstrating the sister-group relationships of these two genera, viz. 2, 3, 5, 13, 18, 28, 30, 40, 41, 73, 76 and 81. *Margdalops* differs from *Amygdalops* in a number of features, both plesiomorphic with respect to those in *Amygdalops* (e.g. 6 – frontal lunule distinct, 8 - arista ciliate, 12 – vti long, 21 – prs distinct, 39 - $CuA_1$ long, 55 – transandrium without medial caudal process, 58 - aedeagal folding apparatus dorsally membranous, 71 – female S7 slightly or unmodified, also 54, 56, 60, 70, 78) and autapomorphic (4 – occiput with a pair of silvery microtomentose stripes, 22 – dc inserted more anteriorly, 32 - wing darkened along anterior margin, 38

– dm cell shorter and very narrow, 51 – medandrium wide and medially shortened, 52 - male cercus strongly sclerotised). These apomorphic features confirm the monophyly of the new genus. Consequently, species of *Margdalops* can be distinguished from all other Anthomyzidae in having an *Amygdalops*-like head with silvery white stripes (at least on occiput), a long ciliate (not pectinate) arista, anteriorly located dc macrosetae, a dark margined wing and a heavily sclerotised male cercus.

At present the genus is known only from Africa. The six new species described below probably represent only a small part of existing species diversity. This is suggested by 3 additional unnamed species (one each from Nigeria, Kenya and Tanzania) which remain undescribed due to insufficient available material. The species are treated below following the systematic order based on the presumed relationships.

## Key to species of **Margdalops**

1 Thorax brown, including pleural and ventral parts. Epandrium (Fig. 14) long and broad; male cercus slender, long (Figs 13, 14); gonostylus slender and distinctly bent (Fig. 18). Female T10 crescent-shaped and cerci very short ....................... **angustus** sp. n.

– Thorax bicolorous, brown dorsally (including dorsal band across pleura), yellow ventrally; mesoscutum sometimes with medial lighter area(s). Epandrium shorter, male cercus, gonostylus and female T10 differently shaped. Female cercus longer …………………… .......................................................................... 2

2(1) Frons (Fig. 42) with silvery white microtomentose stripes covering orbits and with a medial, broad velvety dark brown band between them. First flagellomere bicolorous, brown and white (Fig. 48). Male cercus enlarged, with laterally dilated apex (Fig. 36); gonostylus with tapered distal third (Fig. 40). Female S7 with a transverse dark stripe (Fig. 47) ................................................... **venustus** sp. n.

– Frons with different pattern: silvery stripes narrow, not covering orbits, or absent; medial band never velvety microtomentose. 1st flagellomere either unicolorous yellow to ochreous or darkened anterodorsally. Male genitalia and female S7 differently shaped ......................................................................................... 3

3(2) Mesoscutum brown only laterally, with wide band between dorsocentral lines ochreous orange. Male cercus (Fig. 24) long but slender, slighly dilated in distal half; gonostylus (Fig. 26) simple, broader proximally, with rounded apex. Female T8 more transverse (Fig. 30) and S7 (Fig. 31) simple, dark, longer than broad. ............................................................................................ **signatus** sp. n.

– Mesoscutum completely brown, at most notopleural area paler. Male cercus and gonostylus differetly shaped. Female T8 narrower, less transverse and S7 differently formed ............................................................................................................ 4

4(3) Discal (dm) cell relatively broad (Fig. 66); 2 subvibrissae (short anterior and longer posterior). Male cercus small and narrow (Fig. 4); gonostylus slender, gradually tapered towards apex (Fig. 6). Female T7 with a dark transverse stripe on each side and S7 elongately ligulate (Fig. 8) ................................. **microcercus** sp. n.

– Discal cell distinctly narrower (Figs 70–71); only 1 subvibrissa. Male cercus very enlarged and modified (Figs 53, 55); gonostylus strongly curved or narrowed in the middle. Female T7 unmodified and S7 never ligulate ................................. 5

5(4) Gena white (in male) or yellow (in female) and silvery microtomentose. Medial rows of ac microsetae reaching to posterior dc. Epandrium densely setose; male cercus with frontocaudally flattened ventral half (Fig. 56); gonostylus boot-shaped (Fig. 57). Female S7 (Fig. 64) dark, broader than long; T10 with a medial pale pigmented stripe (Fig. 63) ........................................................ **caligatus** sp. n.

– Gena pale brown, sparsely grey microtomentose. Medial rows of ac microsetae only reaching to anterior dc. Epandrium with sparse setae; male cercus laterally flattened, with apex projecting anteriorly (Figs 53, 54); gonostylus narrowed in the middle (Fig. 49). Female unknown ......................................... **bifilum** sp. n.

## **Margdalops microcercus** sp. n.

(Figs 1–12, 66)

Type material: Holotype male, labelled: ‘KENYA: Mt. ElgonLodge, 1–6.XI.83, A. Freidberg’ (TAUI, genit. prep.). Paratypes: KENYA: 1 female, same data as holotype (TAUI). UGANDA: 1 male 1 female (with apex of abdomen lost), Mbarara, 15.xi.1934, F. W. Edwards (BMNH). All paratypes with genit. prep.

Etymology: The name ‘*microcercus*’ refers to the unusually small male cercus of this species.

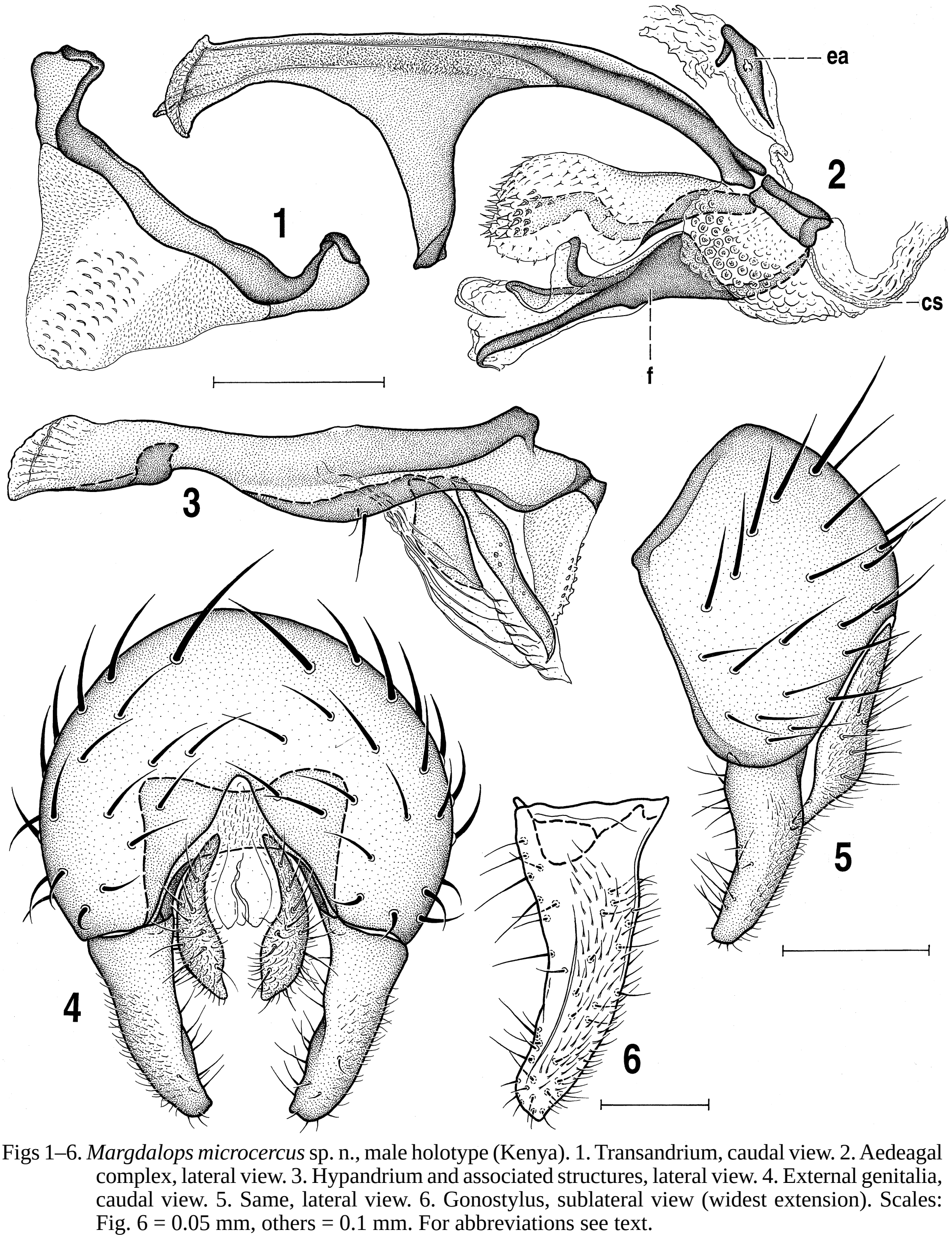
Description: Male.

Total body length: 1.78–2.06 mm. Body brown and yellow.

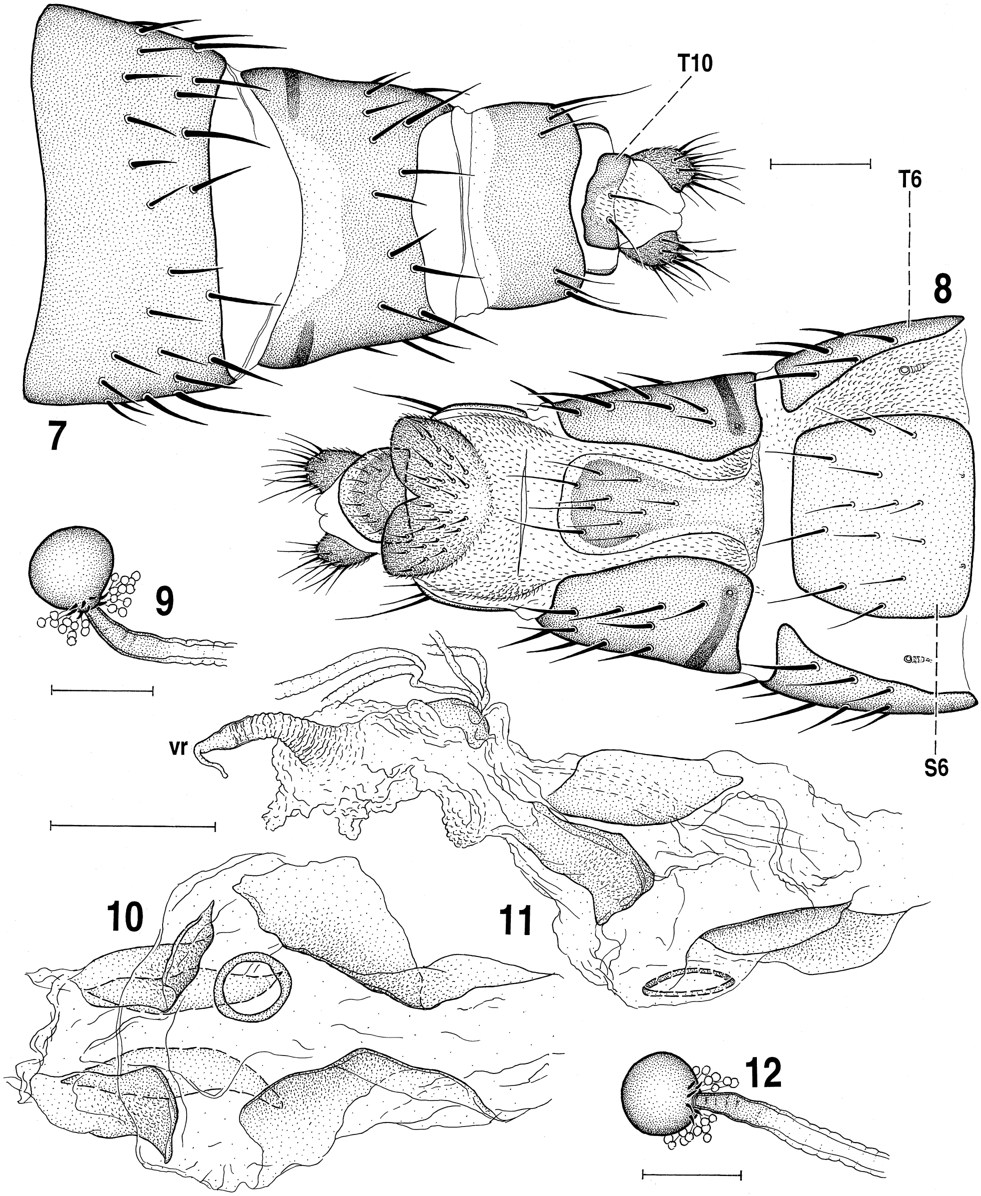
*Head*: Slightly to distinctly longer than high. Frons pattern similar to that of *M. angustus*, but frontal triangle reaching to anterior two-thirds of frons; anterior medial stripe like frontal triangle dull (not velvety) brown. Orbit shining brown. Ocellar triangle slightly convex, shiny. Face yellow-white; gena dirty white and silvery white microtomentose with narrow, pale brown ventral margin; postgena pale brown. Mouthparts whitish yellow. Chaetotaxy as in *M. venustus*, but pvt longer and crossed; vti almost as long as vte and crossed medially; oc less proclinate; 1–2 pairs of microsetulae in front of frontal triangle; vi as long as anterior strong ors; 2 subvibrissae (anterior shorter and weaker, posterior about two-fifths length of vi). Eye with longest diameter about 1.4–1.5 times as long as shortest one. Gena higher than in relatives; its minimum depth 0.1 times as long as shortest eye diameter. Antenna with ochreous scape, pedicel and anterodorsal part at base of arista, remainder of 1st flagellomere yellowish white. Arista about twice as long as antenna, longer ciliate than in other *Margdalops* species.

*Thorax*: Dorsally brown, ventrally yellow. Mesoscutum anteromedially with 2 elongate, sparsely silvery grey microtomentose spots between dorsocentral lines. Humeral and notopleural areas lighter brown than mesoscutum. Pleural area with brown dorsal band, wider anteriorly (covering entire propleuron), narrower posteriorly; remainder of pleura yellow. Chaetotaxy as in *M. venustus*, but setae generally weaker, anterior dc shorter and inserted somewhat nearer to posterior dc, and anterior stpl longer. Scutellum slightly convex dorsally. Legs yellow. Pedal chaetotaxies as in *M. venustus*; $f_3$ with a posteroventral row of 17–18 setae, 5 of which (in distal two-fifths) are short and thickened. Wing pattern (Fig. 66) as in *M. angustus*, but $R_{4+5}$ almost straight, very slightly convergent to M distally, and $CuA_1$ slightly bent. Discal (dm) cell wide and r-m as in *M. angustus*. Wing measurements: length 1.94–2.32 mm; width 0.51–0.68 mm, $Cs_3 : Cs_4$ = 2.84–2.93, r-m/dm-cu : dm-cu = 3.51–3.72. Haltere brown with darker knob.

*Abdomen*: Brown; preabdominal terga similar to those of *M. angustus*, but sterna markedly broader. S2 as long as wide, S3 and S4 slightly longer than wide, S5 wider than long, wider than S4 and slightly emarginate posteromedially. T6 distinct although very weakly sclerotised, transversely band-like. S6–S8 as in *M. angustus*, S7 somewhat longer.



Figs 1–6. *Margdalops microcercus* sp. n., male holotype (Kenya). 1. Transandrium, caudal view. 2. Aedeagal complex, lateral view. 3. Hypandrium and associated structures, lateral view. 4. External genitalia, caudal view. 5. Same, lateral view. 6. Gonostylus, sublateral view (widest extension). Scales: Fig. 6 = 0.05 mm, others = 0.1 mm. For abbreviations see text.



Figs 7–12. *Margdalops microcercus* sp. n., female paratype (Kenya). 7. Postabdomen, dorsal view. 8. Same, ventral view. 9. Spermatheca. 10. Internal sclerites, ventral view. 11. Genital chamber with internal sclerites, lateral view. 12. Spermatheca. Scales: Figs 9, 10 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

*Genitalia*: Epandrium (Figs 4, 5) moderately long, short setose, with dorsolateral setae thicker, dorsomedial pair longest. Anal opening small, rounded triangular, dorsomedially narrowed. Cercus smallest of all congeners, narrow but well sclerotised and its ventral end tapered (Figs 4–5). Medandrium (Fig. 4) also narrow and relatively high. Gonostylus (Figs 5, 6) slender, gradually tapered towards apex, similar to that of *M. angustus*, but less bent and with blunt apex; its outer side with a few setulae among distinct micropubescence being restricted to posterior two-thirds; inner side with scattered setae. Hypandrium not very robust, simple (Fig. 3); transandrium almost straight (Fig. 1); basal membrane medially with small transverse tubercles. Pregonite (Fig. 3) with reduced number of setae (only 1 long and 1 small seta in anterior position). Postgonite (Fig. 3) slender, tapered in distal half, with apex bent anteriorly, without setulae; besides finely striated membrane there is a dark plate-shaped sclerite attached to anteroproximal end of postgonite. Aedeagal part of folding apparatus with small lenticular tubercles; connecting sclerite (Fig. 2) slender, barely sclerotised. Aedeagal complex (Fig. 2) with slender phallapodeme having shortly bifurcate base and laterally dilated apex. Saccus of distiphallus unusually small, membranous, but with a pair of relatively long internal sclerites and with spines and spinulae, particularly numerous at apex. Filum short and robust, formed by 2 proximally fused, distally diverging and rifted sclerites connected by membrane, hence apex broad and lobate (Fig. 2). Ejacapodeme larger and darker than in the *M. venustus* group, with slender subapical projection (Fig. 2).

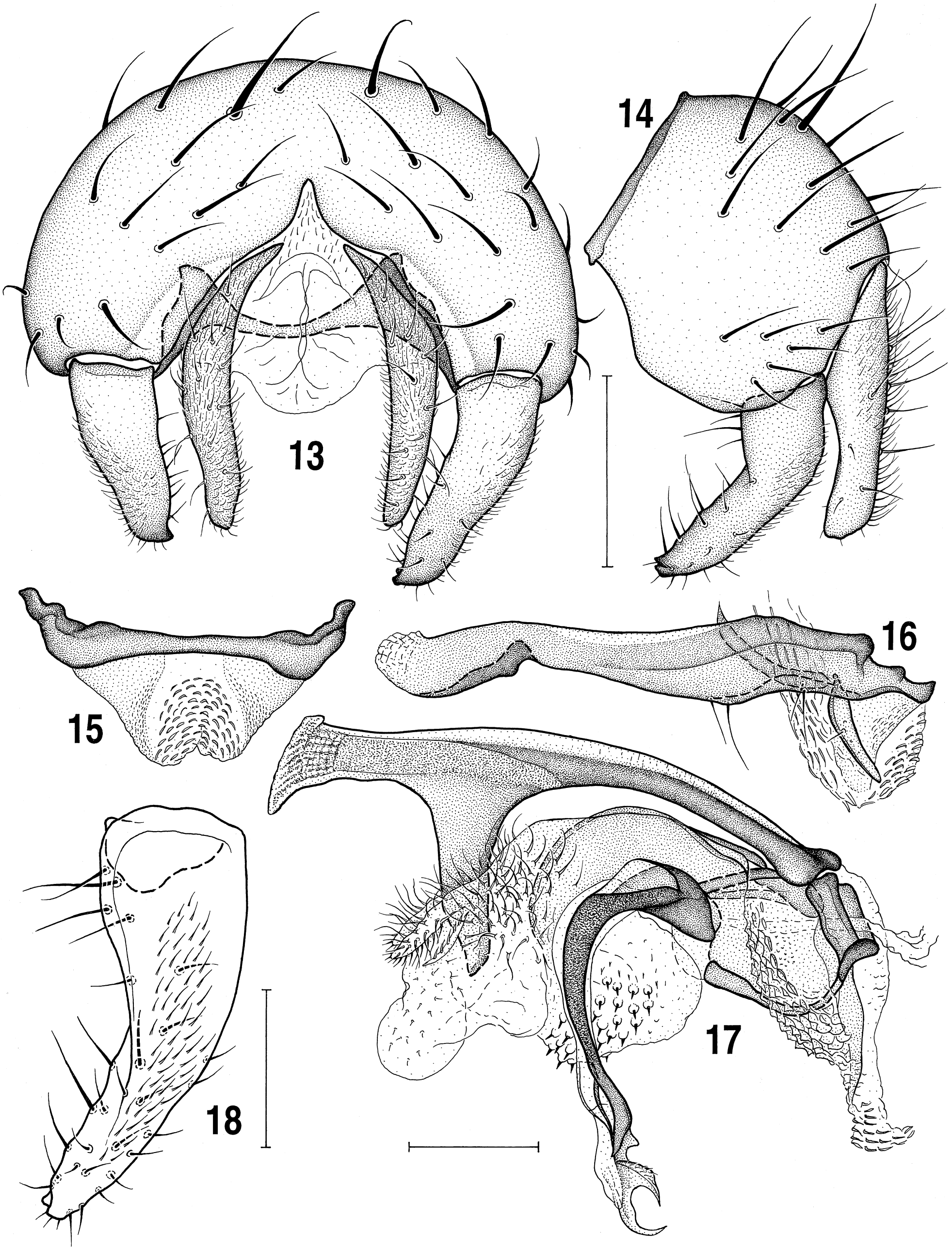
Female differs from male as follows:

Total body length 2.02–2.46 mm.

Face, gena and antenna somewhat darker (yellow on gena to ochreous-brown on pedicel). Humeral area sometimes ochreous. $f_3$ posteroventrally finely setulose. Wing measurements: length 2.24–2.66 mm; width 0.65–0.79 mm, $Cs_3 : Cs_4$ = 2.79–3.14, r-m/dm-cu : dm-cu = 3.73–3.77. Abdomen with T2–T5 wider and more transverse. S2–S5 wider than in *M. angustus*, S3–S5 slightly or hardly (S5) longer than wide.

Postabdomen (Figs 7–8) relatively long and narrow. T6 slightly wider than T7, with short thick setae in posterior half. S6 relatively narrow, as wide as S5 but slightly shorter, sparsely setose. T7 long, extended on ventral side of abdomen (even enclosing 7th spiracles), with anteromedial emargination, a dark transverse lateral stripe on each side, and thick setae in posterior half. S7 narrow, elongately ligulate, but posteriorly dilated (Fig. 8), with longer setae in posterior half. T8 simple transverse, with posteromedial emargination and fine setae in rounded posterior corners. S8 dark, slightly smaller than T8, subcordate, shortly setulose. T10, short, transverse, dark, unpigmented posteromedially, with microtomentum restricted to medial area. S10 slightly wider, paler and longer than T10. Internal sclerotisation of genital chamber (Figs 10, 11), composed of 3 pairs of crooked, partly coalesced sclerites and of a ventral ring-shaped sclerite (Fig. 10). Ventral receptacle (Fig. 11) subconical to flask-shaped, proximally ringed and with apical s-shaped vermicular projection. Spermathecae 1+1 (Figs 9, 12) subspherical, one slightly larger than the other, with small dark spines on slightly projected base around duct insertion, and with long (longer than spermatheca) sclerotised cervix gradually merging into membranous duct. Cercus (Fig. 7) very short and dark.

Discussion: *M. microcercus* sp. n. forms, together with *M. angustus* sp. n. and *M. signatus* sp. n., the *M. angustus*-group. Its monophyly is demonstrated by 4 character states, viz.



Figs 13–18. *Margdalops angustus* sp. n., male holotype (S. Africa). 13. External genitalia, caudal view. 14. Same, lateral view. 15. Transandrium, caudal view. 16. Hypandrium and associated structures, lateral view. 17. Aedeagal complex, lateral view. 18. Gonostylus, sublateral view (widest extension). Scales: Fig. 18 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

ejacapodeme enlarged; filum of distiphallus compact, with paired sclerites fused and apically provided with teeth or processes; female internal ring-shaped sclerite well developed; female cercus very short and dark. The inter-relationships of these species has not been resolved (see below). *M. microcercus* sp. n. is considered the most primitive species of *Margdalops* because it retains a number of plesiomorphies unknown in other congeners (e.g. small cercus, narrow medandrium, large basal sclerite of postgonite). On the other hand, its female postabdomen displays several advanced features (modified, narrowly ligulate S7; expanded T7 enclosing spiracles; long cervix of spermatheca). Besides these diagnostic characters, the species can also be recognised by having 2 subvibrissae (otherwise only in *M. signatus* sp. n.), the pregonite with only anterior setae, a reduced saccus, and by a characteristic filum of the distiphallus.

Biology: All type specimens (2 males 2 females) were collected in November.

Distribution: Kenya, Uganda.

## **Margdalops angustus** sp. n.

(Figs 13–23, 67)

Type material: Holotype male, labelled: 'E. Cape Prov., Katberg. 4,000 ft., xii.1932, S. AFRICA: R. E. Turner, Brit. Mus. 1933-69.' (BMNH, genit. prep.). Paratypes: SOUTH AFRICA: *KwaZulu-Natal*: 1 female, Eshowe, Dlinza Forest Nature Res, 2831Cd, 450 m, indig. forest, 22.xii.1979, R. Miller & P. Stabbins (NMSA); 1 female, Oribi Gorge Reserve, Umzimkulwana Valley, 21–28.xi.1960, 1 female, B. & P. Stuckenberg (NMSA); 3 females, Pietermaritzburg, Town Bush, 2.xi.1954, B. Stuckenberg (NMSA, 1 SMOC). *Eastern Cape*: I female (damaged), Transkei, W. The Haven, 3228Bb, indigenous forest, 25–28.vi.1979, R. Miller & P. Stabbins (NMSA); 1 female, Transkei, 3129cd, Hluleka Nature Res., 21–25.vii.1981, R. F. Fregona (NMSA). *Western Cape*: 1 female, Groot Rivier Pass nr. Plettenberg Bay, indigenous forest, 11.x.1959, B. & P. Stuckenberg (NMSA). Most paratypes with genit. prep.

Etymology: The species is named '*angustus*' (L. = narrow) because of its narrow, silvery microtomentose stripes along the frontal triangle, and the narrow male cercus and gonostylus.

Description: Male.

Total body length 2.10 mm. Body brown to dark brown, only extremities yellow.

*Head*: Slightly to distinctly longer than high. Occiput and frons as in *M. venustus*, but frontal triangle distinct, narrow and reaching to anterior two-fifths of frons, silvery white stripes narrower and restricted to boundary between orbits and frontal triangle (thus orbits brown and shiny), and medial stripe in front of frontal triangle narrow and without velvety microtomentum. Ocellar triangle slightly convex, bare. Face and gena whitish yellow, the latter silvery white microtomentose and with a pale brown ventral margin; postgena pale brown, subshiny. Mouthparts yellow, including palpus. Chaetotaxy: pvt short, strongly convergent; vte, vti, oc and posterior ors strong, subequal in length; oc less proclinate, but ors as in *M. venustus*, 2–3 pairs of microsetulae in front of frontal triangle; vi as long as anterior strong ors, but weaker; subvibrissa about two-thirds length of vi. Eye with longest diameter about 1.3 times as long as shortest one. Gena posteriorly slightly widened; its minimum depth 0.06 times as long as shortest eye diameter. Antenna with scape, pedicel and anterodorsal half of 1st flagellomere pale brown, remainder of latter whitish yellow. Arista 1.9 times as long as antenna, longer and more densely ciliate than that of *M. venustus*.

*Thorax*: Dark brown, sparsely brownish, only mesoscutum anteromedially whitish grey, microtomentose. Chaetotaxy as in *M. venustus* but anterior dc longer and situated more anteriorly; anterior stpl about two-thirds length of the posterior. Scutellum convex dorsally. Legs yellow. Pedal chaetotaxies as in *M. venustus*; $f_3$ with a posteroventral row of about 12 setae, 5 of which (in apical third of femur) are shortened and thickened. Wing pattern (Fig. 67) differs from that of *M. venustus*: dark band along anterior margin longer, basally also distinct near $R_1$. $R_{2+3}$ very long, subparallel to C. $R_{4+5}$ very slightly and gradually converging to M distally. Discal cell wider than that of *M. venustus* and r-m situated in its basal two-fifths. $CuA_1$ straight, nearly reaching wing margin. Wing measurements: length 2.18 mm; width 0.67 mm, $Cs_3 : Cs_4 = 4.17$, r-m/dm-cu : dm-cu = 4.00. Haltere dark brown.

*Abdomen*: Dark brown. Preabdominal terga broad, transverse, with sparse, short and thick setae. Sterna S2–S5 narrower than in *M. venustus*, becoming wider posteriorly. S3 1.5 times as long as wide, S4 slightly longer than wide, S5 distinctly wider than long, broader posteriorly, with shallow posteromedial emargination. T6 small, membraneous, barely visible. S6–S7 as in *M. venustus*, but S6 and S7 more coalesced and S8 shorter.

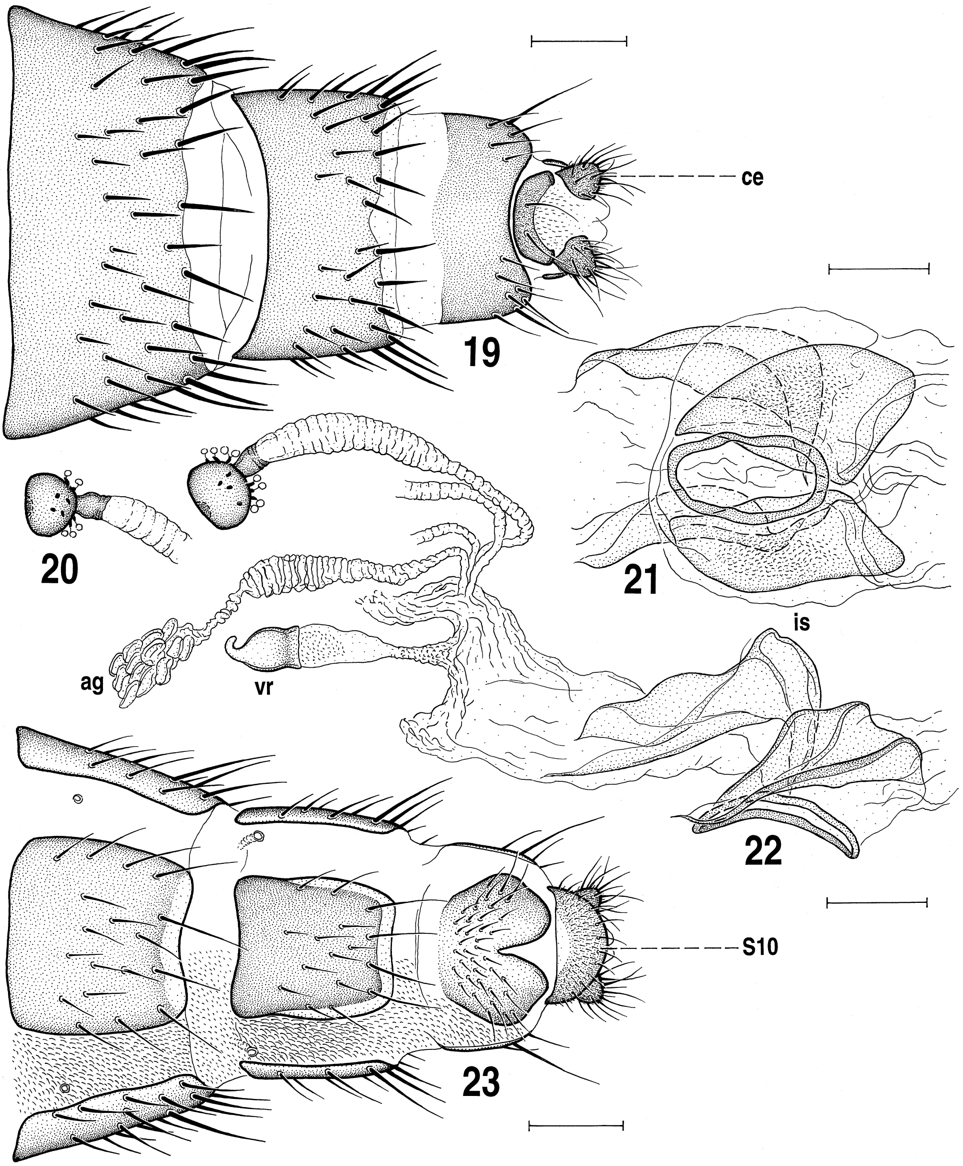
*Genitalia*: Epandrium (Figs 13, 14) longest of all congeners, broad, with moderate setosity, dorsomedial pair od setae longest and strong. Anal opening relatively small, rounded triangular, dorsomedially strongly narrowed. Cercus slender and long, well sclerotised, with blunt apex and microtomentum on posterior side (Figs 13–14). Medandrium (Fig. 13) reduced, very low dorsomedially. Gonostylus (14, 18) slender, distinctly curved, gradually tapered towards apex which terminates in 2 small teeth; its outer side with micropubescence restricted to middle two-thirds; inner side with scattered setae. Hypandrium slender, simple (Fig. 16); transandrium almost straight (Fig. 15); basal membrane medially with small transverse tubercles. Pregonite (Fig. 16) with 2 setae in anterior and 2 in posterior group. Postgonite (Fig. 16) slender, small, tapered, but apex not very pointed, with 1 setula in basal third; besides very finely striated membrane there is a dark band-shaped sclerite attached to base of postgonite. Aedeagal part of folding apparatus with short spine-like hyaline tubercles; connecting sclerite (Fig. 17) very slender, weakly sclerotised. Aedeagal complex (Fig. 17) with moderately developed phallapodeme having shortly bifurcate base and somewhat dilated apex. Saccus of distiphallus voluminous, membranous but its basal half weakly sclerotised in addition to 2 basal sclerites; its membrane armed by dense fine setulae (dorsopreapically) and spinulae on tubercles (ventropreapically). Filum robust, formed by 2 largely fused, only distally diverging sclerites which apically end in several sharp processes (Fig. 17). Ejacapodeme (not figured) relatively large, similar to that of *M. signatus*, but its long projection with simple apex.

Female differs from male as follows:

Total body length 2.34–2.98 mm.

Face, gena and antenna somewhat darker yellow; 1st flagellomere anterodorsally brown. Microsetulae medially in front of frontal triangle more numerous (3–5 pairs). $f_3$

posteroventrally finely setulose. Wing measurements: length 2.26–2.94 mm;width 0.69–0.87 mm, $Cs_3 : Cs_4 = 2.82–3.92$, r-m/dm-cu : dm-cu = 3.46–4.18. Abdomen with T2–T5 more transverse. T2 distinctly shorter than T3; T4 the longest. Sterna paler brown than terga, narrow, pleural membrane large. S2 as long as wide, S3–S5 distinctly longer than wide, S3 the longest sternum, more than 1.5 times as long as wide.



Figs 19–23. *Margdalops angustus* sp. n., female paratype (S. Africa). 19. Postabdomen, dorsal view. 20. Spermatheca. 21. Internal sclerites, ventral view. 22. Genital chamber with internal sclerites, lateral view. 23. Postabdomen, ventral view. Scales: Figs 19, 23 = 0.1 mm, others = 0.05 mm. For abbreviations see text.

Postabdomen (Figs 19, 23) relatively long and slender. T6 slightly wider than T7, with short thick setae in posterior two-thirds. S6 as wide as long, sparsely setose. T7 moderately long, not extended on ventral side of abdomen, with shallow anteromedial emargination and dense thick setae in posterior two-thirds. S7 longer than broad, dark except lateral and posterior margins (Fig. 23), with long setae in posterior row. T8 simple, transverse, anteriorly poorly delimited, posteromedialy shallowly emarginate, with fine setae in rounded posterior corners. S8 dark, smaller than T8, subcordate, setosity short and dense. T10 very short, tranversely crescent-shaped, dark, microtomentose. S10 also short but wider, paler and longer than T10. Genital chamber (Figs 21, 22) with 3 pairs (2 anterior largely coalesced) of internal twisted sclerites and 1 ventral oval ring-shaped sclerite. Ventral receptacle (Fig. 22) cup-like, weakly slerotised and proximally constricted, with short curved apical projection. Accessory gland on ringed, distally widened duct. Spermathecae 1+1 (Fig. 20) subspherical, with small terminal invagination, minute dark spines in basal half, and with short and broad sclerotised cervix. Cercus (Fig. 19) very short, dark.

Discussion: This member of the *M. angustus*-group can be easily distinguished from all congeners by the unicolorous brown thorax. Although its slender gonostylus and internal sclerites are similar to those of *M. microcercus* sp. n., its distiphallic filum and female postabdominal sclerites resemble those of *M. signatus* sp. n. Therefore, the species seems to be intermediate between these members of the group. Further diagnostic features are: male cercus long and slender; gonostylus bent in the middle; anal opening dorsally strikingly narrowed; saccus setose anterodorsally; female ring-shaped sclerite elongate; female T10 transversely crescent-shaped.

Biology: Adults were collected in June/July and October to December. The species may be associated with indigenous forests. Females dominate the type series (8:1).

Distribution: The species is only known from South Africa.

### **Margdalops signatus** sp. n.

(Figs 24–35, 68)

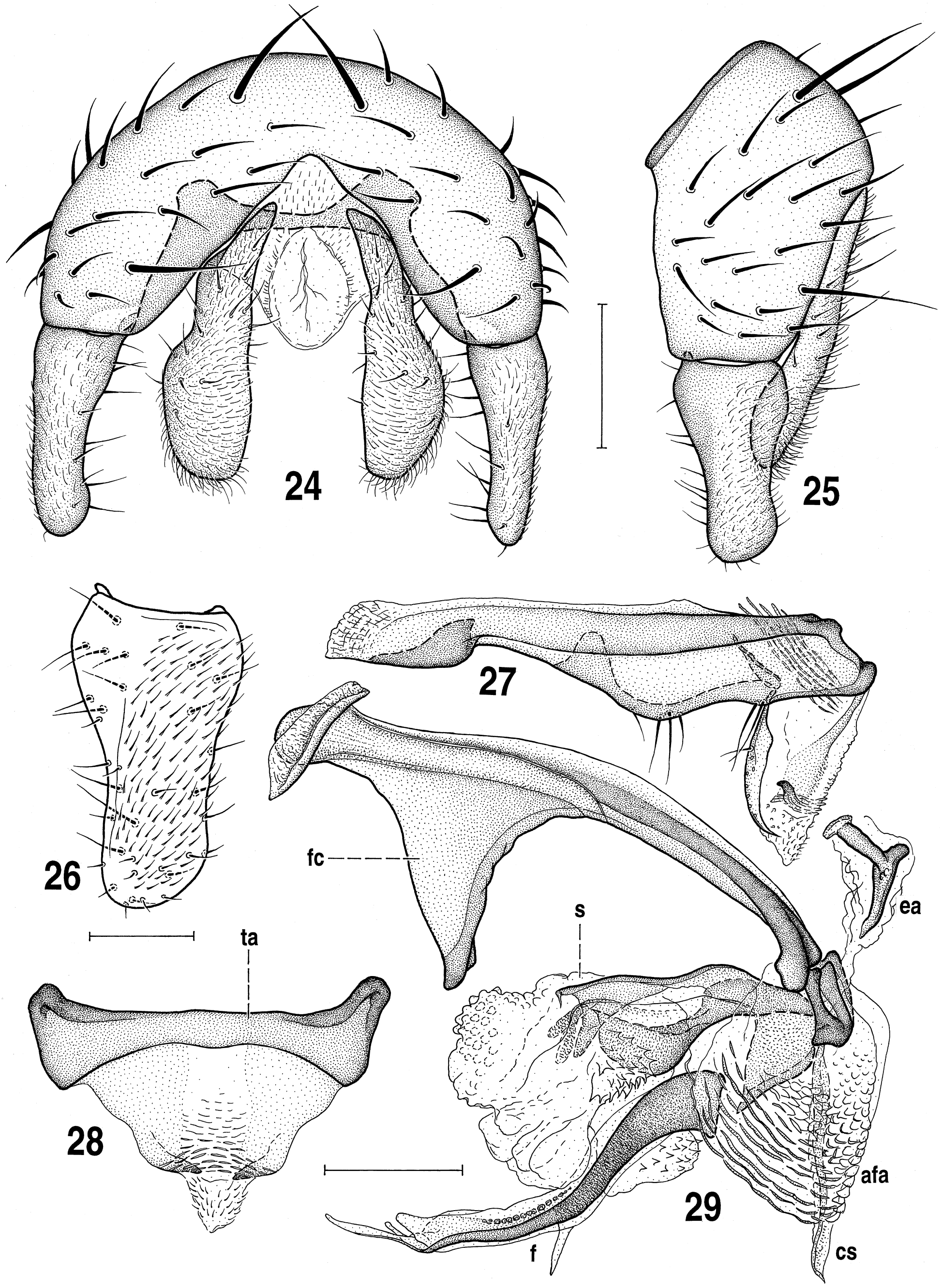
Type material: Holotype male, labelled: ‘Karen, Nairobi, Kenya. 31 May 1973. D. K. McAlpine’ (AMSA, intact). Paratypes: KENYA: 3 males 6 females, same data as as holotype (AMSA, 1 male 1 female SMOC). Five paratypes with genit. prep.

Etymology: Named ‘*signatus*’ (L. = marked, signated) because of the distinctive mesonotal pattern.

Description: Male.

Total body length 2.02–2.22 mm. Body brown and yellow.

*Head*: Slightly longer than high. Occiput with silvery microtomentose stripes wide, almost meeting medially. Frons with pattern similar to that of *M. angustus*, but frontal triangle reaching to anterior two-thirds of frons and silvery white stripes wider, particularly anteriorly. Ocellar triangle slightly convex, shiny. Face ochreous, medially ochreous brown. Gena and postgena dirty whitish yellow, sparsely silvery microtomentose and gena with narrow brown ventral margin. Mouthparts yellow. Chaetotaxy as in *M. venustus,* but pvt longer and crossed; vti less convergent and shorter than vte; 1–2 pairs of microsetulae in front of frontal triangle; vibrissal chaetotaxy as in



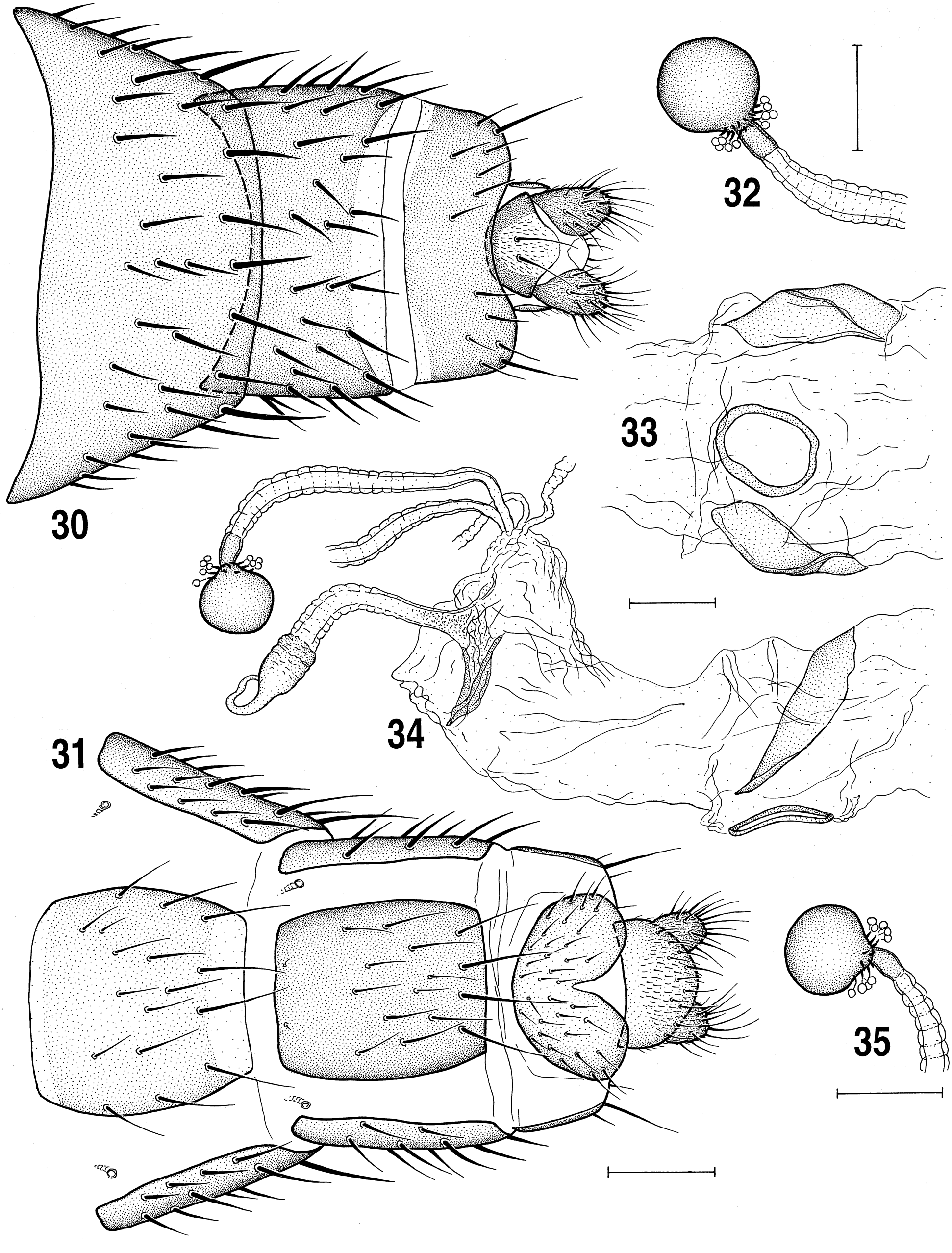
Figs 24–29. *Margdalops signatus* sp. n., male paratype (Kenya). 24. External genitalia, caudal view. 25. Same, lateral view. 26. Gonostylus, sublateral view (widest extension). 27. Hypandrium and associated structures, lateral view. 28. Transandrium, caudal view. 29. Aedeagal complex, lateral view. Scales: Fig. 26 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

*M. microcercus*, thus with 2 subvibrissae, 1 short anterior and 1 longer posterior. Eye less ovoid, with longest diameter only 1.25–1.3 times as long as shortest one. Gena slightly widened posteriorly; its minimum depth about 0.07 times as long as shortest eye diameter. Antenna ochreous to ochreous brown, anteroventral half of 1st flagellomere pale yellow. Arista about 1.9 times as long as antenna, long ciliate.

*Thorax*: Paler than in all congeners. Mesonotum brown but with broad ochreous orange longitudinal band between dorsocentral lines, often extended on disc of scutellum; usually there is a narrow brown medial stripe in anterior third of the latter band; humeral and notopleural areas ochreous. Pleural areas with dorsal brown band narrow; otherwise yellow. Chaetotaxy similar to *M. venustus*, but characterised by shorter prs and, particularly, by weak anterior dc (shorter and inserted more posteriorly than in *M. microcercus*); medial row of ac setulae almost reaching to posterior dc. Legs yellow to pale yellow. Pedal chaetotaxies as in *M. venustus*; $f_3$ with posteroventral row of 17–18 setae, 5–6 of them shortened and thickened. Wing pattern (Fig. 68) as in *M. angustus*. $R_{4+5}$ and M subparallel, distally very slightly or hardly convergent. Discal cell broad as in *M. angustus*, with r-m situated slightly anterior to its middle. $CuA_1$ long, straight. Wing measurements: length 2.22–2.46 mm; width 0.63–0.73 mm, $Cs_3 : Cs_4$ = 2.31–2.60, r-m/dm-cu : dm-cu = 3.20–3.70. Haltere brown with blackish brown knob.

*Abdomen*: Dark brown, sterna brown. Preabdominal terga as in *M. microcercus*; T6 very short, transverse, weakly sclerotised and pale pigmented. S3–S4 slightly longer than wide; S5 wider than long and posteromedially emarginate. S6 and S7 very short.

*Genitalia*: Epandrium (Figs 24, 25) short, very broad, shortly setose, but with 1 long robust dorsomedial seta and 1 long ventrocaudal seta. Anal opening rounded triangular. Cercus long, slender, with ventral half somewhat dilated, apically rounded; its surface largely microtomentose (Figs 24, 25). Medandrium (Fig. 24) wide, medially very short. Gonostylus (Figs 25, 26) simple, flat, wider proximally, narrower distally, with apex broadly rounded; its outer side micropubescent; inner side with scattered setae. Hypandrium moderately developed, simple (Fig. 27); transandrium straight and simple; lateral sides of basal membrane weakly sclerotised, but apically provided with small, dark sclerotised process (Figs 27, 28). Pregonite (Fig. 27) posteriorly indistinctly projecting, with two groups of setae (3–4 in anterior, 2 in posterior group). Postgonite (Fig. 27) very slender, flat, slightly curved, apically acute and bearing 1 anterior seta in basal third; sclerite at base of postgonite present but small; membrane attached internally to postgonite finely striated. Aedeagal part of folding apparatus provided with hyaline lenticular tubercles and dark undulate striae; connecting sclerite (Fig. 29, cs) very slender, weakly sclerotised. Basal membrane (Fig. 28) with small transverse tubercles (in the middle) and fine spinulae (ventrally). Aedeagal complex (Fig. 29) with moderately developed phallapodeme with shortly bifurcate base and laterally dilated apex. Saccus relatively short, with membranous dilated distal half (apically with a group of hyaline tubercles, basally with 2 groups of short spines) and narrower proximal half reinforced with a pair of dark sclerites in addition to a somewhat ventrally projecting base. Filum robust, formed by 2 completely fused sclerites and bearing several unpigmented projections, including 1 slender in the middle and 3 (1 flat, 2 slender) on apex. Ejacapodeme larger, with terminally clubbed projection (Fig. 29).



Figs 30–35. *Margdalops signatus* sp. n., female paratype (Kenya). 30. Postabdomen, dorsal view. 31. Same, ventral view. 32. Spermatheca. 33. Internal sclerites, ventral view. 34. Genital chamber with internal sclerites, lateral view. 35. Spermatheca. Scales: Figs 30, 31 = 0.1 mm, others 0.05 mm. For abbreviations see text.

Female differs from male as follows:

Total body length 2.34–2.66 mm.

Face pale brown; gena, postgena and mouthparts darker yellow. Antenna with 1st flagellomere darker, ochreous brown, including apex, often darker than pedicel. Usually 2 pairs of microsetulae in front of frontal triangle. $f_3$ posteroventrally finely setulose. Wing measurements: length 2.58–2.90 mm; width 0.73–0.89 mm, $Cs_3 : Cs_4 = 2.38$–2.72, r-m/dm-cu : dm-cu = 3.30–3.92. Abdomen with preabdominal terga more transverse and sterna narrower. S3 1.5 times as long as wide, narrower than S4; S5 the widest and about as long as broad.

Postabdomen (Figs 30, 31) moderately long. T6 wider than T7, with short thick setae in posterior two-thirds. S6 narrower than S5, as long as wide, pale pigmented, with membranous margins and sparsely setose. T7 long, dorsomedially short due to anteromedial emargination, with thick setae in posterior two-thirds. S7 longer than broad, dark pigmented (Fig. 31), with fine setae in posterior two-thirds, those in posterior row long. T8 broad, distinctly transverse, posteromedially emarginate, with fine setae in posterior half. S8 dark, smaller than T8, subcordate, shortly setulose. T10 small, pentagonal, dark only along anterior and lateral margins, with microtomentum restricted to central light area. S10 longer than T10, semicircular. Genital chamber (Figs 33, 34) with only 1 pair of crooked sclerites (others membranous) and 1 ventral ring-shaped sclerite. Ventral receptacle (Fig. 34) subcylindrical, proximally ringed and weakly sclerotised, apically narrowed and merging into apical, recurved and sinuate vermicular projection. Spermathecae 1+1 (Figs 32, 35) subspherical, similar to those of *M. microcercus*, but both subequal, with short cervix. Cercus (Fig. 30) short but robust, dark pigmented.

Discussion: *M. signatus* sp. n. belongs to the *M. angustus*-group. It can be distinguished from other species of the group as well as remaining congeners by the ochreous orange band between the dorsocentral lines on the mesonotum. It is further diagnosed by 2 subvibrissae (otherwise only known in *M. microcercus* sp. n.); a very broad epandrium; male cercus dilated in ventral half; ventrolateral sclerotisation of basal membrane; armature of of saccus and filum of distiphallus; the transverse female T8; and reduced number of female internal sclerites.

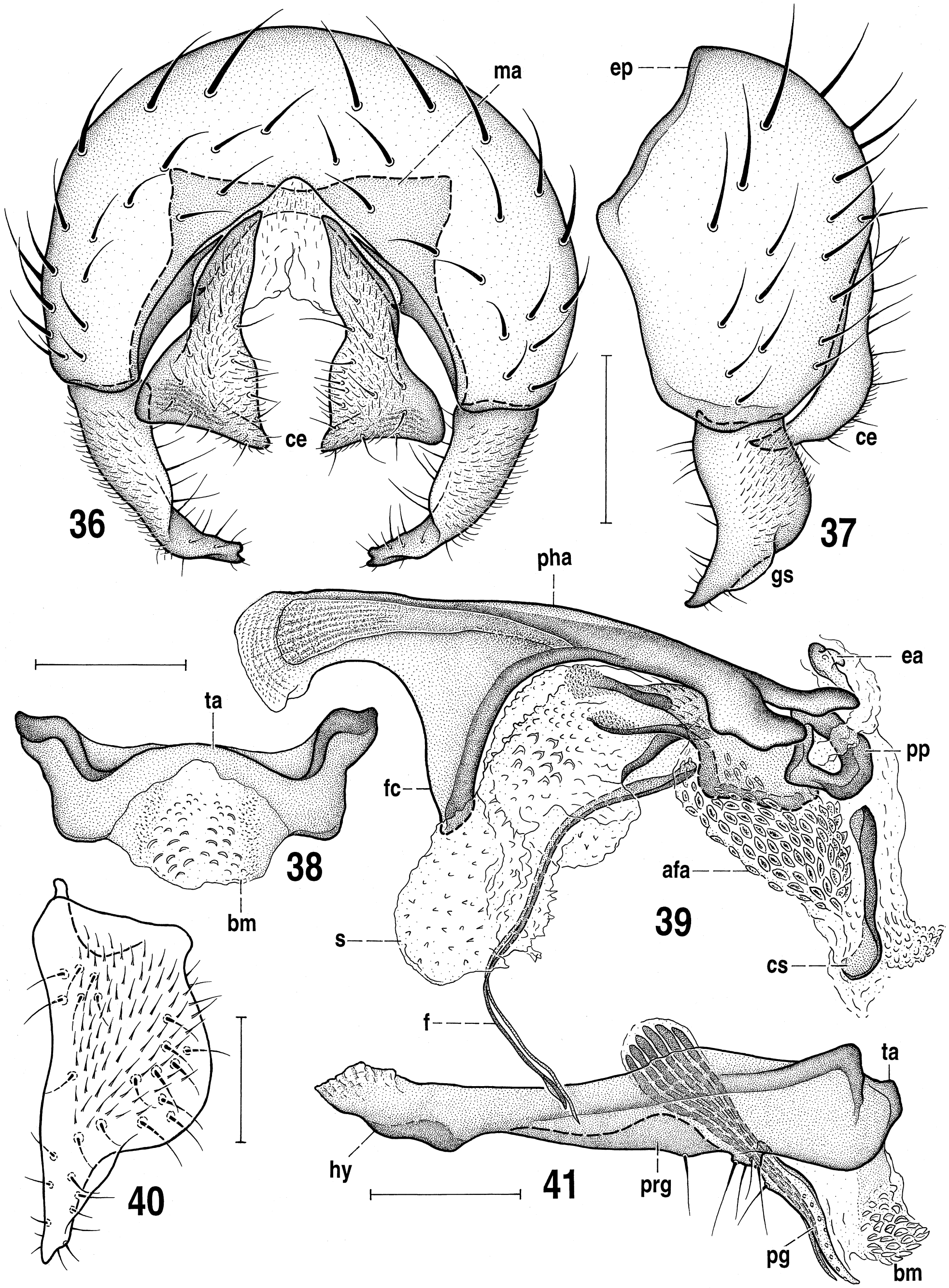
Biology: The entire type series was collected in May.

Distribution: The species is known only from Kenya.

## **Margdalops venustus** sp. n.

(Figs 36–48, 69)

Type material: Holotype male, labelled: 'SO. AFRICA: Natal, Bisley Valley, Pietermaritzburg, 12.XII.1978, R. Earlé, ex bird's nest cape robin, R. M. Miller', 'adult emerged 19.I.1979, E-IIA, ex. bird nest' (intact, NMSA). Paratypes: SOUTH AFRICA: *KwaZulu-Natal*: 1 male, same data as holotype, but emerged 23.i.1979, E-IIA, 1 male, emerged 14.i.1979, E-IIB, 1 male, emerged 16.i.1979, E-IIB, 1 male [no mergence data]; 1 female, same locality, E. 5.xii.1978, R. Earlé, ex bird's nest, 2.II.XII., cape robin [with puparial shell]; 1 female, same locality, E. 6.xii.1979, R. Earlé, ex bird's nest cape robin [with puparial shell] (NMSA, SMOC); 1 female, Enseleni,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Figs 36–41. *Margdalops venustus* sp. n., male paratype (S. Africa). 36. External genitalia, caudal view. 37. Same, lateral view. 38. Transandrium, caudal view. 39. Aedeagal complex, lateral view. 40. Gonostylus, sublateral view (widest extension). 41. Hypandrium and associated structures, lateral view. Scales: Fig. 40 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

28°41'S:32°03'E, 26.vii.1980, R. M. Miller (NMSA); 1 male, Merrivale, Tschwalabenyoni, 29°31'S:20°15'E, 1000 m, 20.x.1992; 1 male, Merrivale, nr. Howick, Stuckenberg farm, at light, 9–13.x.1990, both B. R. Stuckenberg leg. (NMSA); 1 female, Richards Bay, 2832c, at light, 21–24.i.1980, R. Miller & P. Stabbins (NMSA); 1 female, St. Lucia Park, 7–8.x.1983; 1 female, Matubatuba Distr., Dukuduku Forest, 7.x.1983, both A. Freidberg leg. (TAUI); 2 males, Zululand, Dukuduku, between St Lucia & Matubatuba, 7–8.iv.1960, B. & P. Stuckenberg (NMSA). *Limpopo*: 1 female, Rt.1, Soutpansberg, Ingwe Ranch, 1100 m, at light, 24.xii.1994, A. Freidberg (TAUI). *Eastern Cape*: 1 male, Katberg, 4000 ft, 1–13.xi.1932, 1 male 1 female, 14–26.xi.1932, 2 males 1 female, xii.1932, 1 male, 15–30.i.1933, all R. E. Turner leg. (BMNH). *Western Cape*: 1 female, Mossel Bay, 18–30.xi.1921, 1 male, xii.1921, 1 female, i.1922, 2 females, ii.1922, all R. E. Turner leg. (BMNH). Most paratypes with genit. prep.

Etymology: The species is named '*venustus*' (L. = graceful) because of its strikingly coloured frons with a silvery white and velvety brown pattern.

Description: Male.

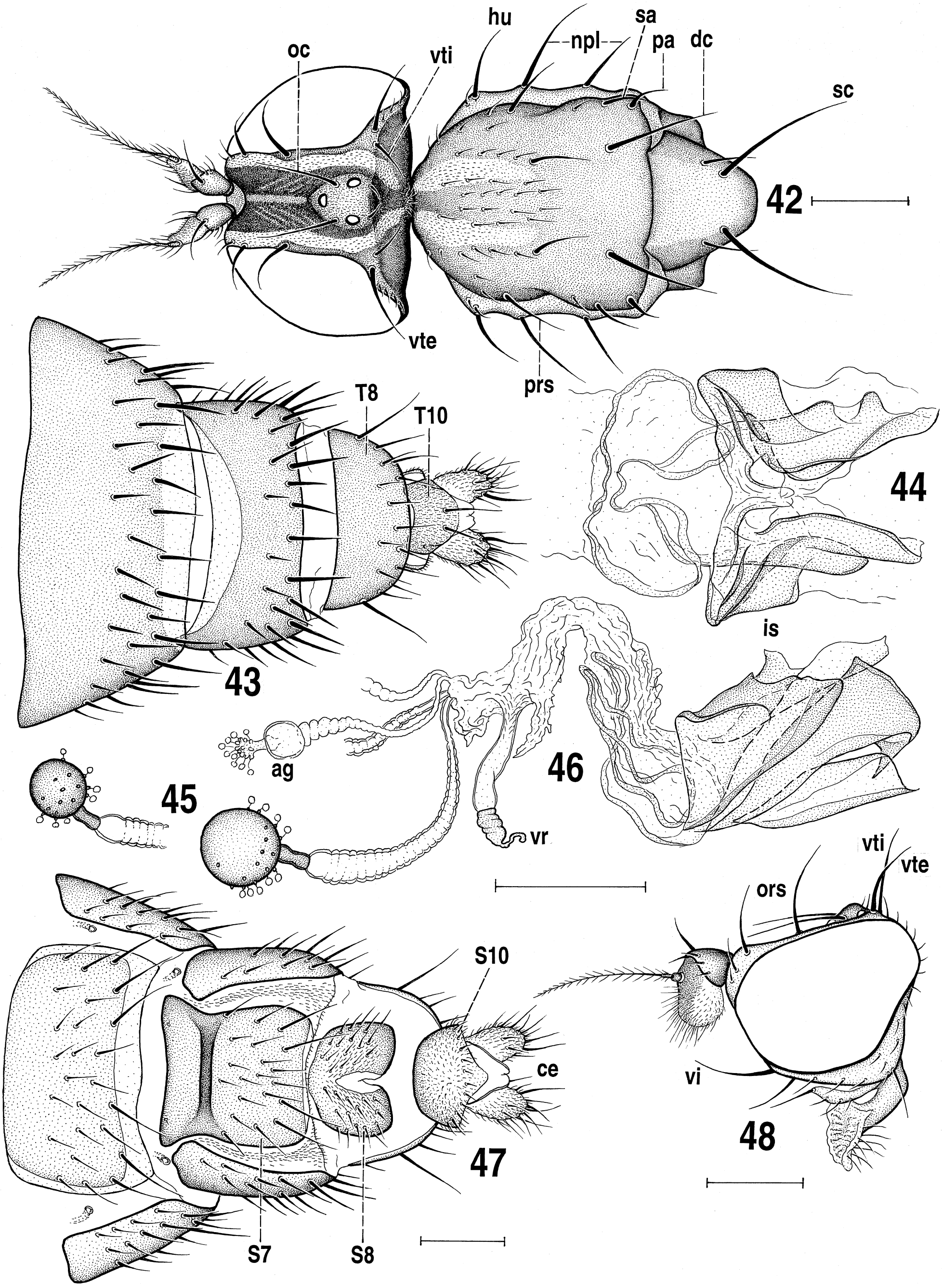
Total body length 1.53–2.15 mm. Body bicolorous, brown and whitish yellow.

*Head*: As long as or slightly longer than high, angular in profile (Fig. 48). Frons relatively narrow because of large eyes (Fig. 42). Occiput concave, brown, medially with 2 convergent, silvery microtomentose stripes. Frons (Fig. 42), ornamented by lateral, silvery white microtomentose stripes reaching from foremost margin of orbit to ventral part of occiput and by medial, velvety dark brown microtomentose band covering most of frons except for ocellar triangle. The brown frontal band is interrupted by a narrow medial, pale brown stripe and is usually obliquely dark striated in front of ocellar triangle. Frontal triangle poorly delimited; ocellar triangle distinctly convex, brown; ocelli large. Orbit anteriorly ochreous (besides silvery microtomentose); frontal lunule pale brown. Face narrow, ochreous, with darker medial stripe and narrow brown lateral margins; gena white and silvery microtomentose, anteriorly with brown margin; postgena whitish yellow. Mouthparts yellow, palpus whitish yellow. Chaetotaxy: pvt short but distinct, with apices meeting medially; vti as long as vte, strongly convergent, often with apices crossed; vte exclinate and with a short inclinate seta behind its base; oc long and thin, markedly proclinate (Fig. 48); 2 long ors and 2 small setulae (the anterior much smaller) in front of the anterior one (Fig. 48), the posterior ors subequal in length to vte, vti, and oc, the anterior ors markedly shorter; 1 long curved vi and 1 subvibrissa (about two-thirds length of vi); peristomal setulae short and few; postocular setulae very short and more numerous; 1 longer seta on postgena as usual; palpus with 1 distinct dark seta on apex. Eye convex, elongately ovoid; its longest diameter about 1.4 times as long as shortest one. Gena very narrow anteriorly, widened posteriorly; its minimum depth about 0.08 times as long as shortest eye diameter. Antenna knee-like bent; its scape (minute) and pedicel brown, the latter overlapping base of 1st flagellomere which is bicolorous, brown anteriorly and white posteriorly (Fig. 48); arista about 1.7–1.8 times as long as antenna, long ciliate (not pectinate).

*Thorax*: Slightly narrower than head, brown dorsally and whitish yellow ventrally. Mesonotum (Fig. 42) brown and sparsely microtomentose, except for two ochreous (anteriorly with sparse silver microtomentum), longitudinally elongate spots between dorsocentral lines reaching up to anterior dc setae; humeral and notopleural areas often lighter brown than mesoscutum; scutellum, on the contrary, darker brown. Pleural areas with a narrow brown longitudinal stripe covering dorsal part (from propleuron to base of abdomen); remainder of pleura whitish yellow. Chaetotaxy (see Fig. 42): 1 hu, 2 npl (anterior distinctly longer); 1 distinct (as long as hu) prs; 1 weak sa and 1 longer pa; 2 dc, anterior long (longer than anterior npl) and situated relatively far forwards (in half distance between suture and posterior dc), posterior dc strong, as long as apical sc; 4 rows ac microsetae on suture but no ac behind anterior dc; 2 sc, the apical long, the laterobasal small, shorter than sa; 1 ppl, reduced to microsetula; 2 stpl, the anterior only about half length of the posterior; ventral part of sternopleuron with sparse, fine setae. Scutellum triangular with rounded corners, distinctly convex dorsally. Legs yellow to whitish yellow (coxae, trochanters). $f_1$ lacking ctenidial spine but bearing a row of posteroventral setae (5–6 long) and a row of somewhat shorter posterodorsal setae. $t_2$ with usual ventroapical seta. $f_3$ with a long row of 11–13 posteroventral setae, 4–5 of which in distal third of $f_3$ shortened and thickened. Wing (Fig. 69) narrow, with brown fumose membrane with dark brown band along anterior margin, up to apex of $R_{4+5}$. Veins brown. C without thick spinulae among usual setulae. $R_{2+3}$ sinuously bend and running very close to C; $R_{4+5}$ also slightly sinuous and distinctly convergent to M towards apex of wing. Discal (dm) cell short and very narrow; r-m situated near its middle. $CuA_1$ relatively long and, like $A_1$, not reaching wing margin. Anal (cup) cell and alula very narrow, the latter dark brown. Wing measurements: length 1.54–2.15 mm; width 0.45–0.66 mm, $Cs_3 : Cs_4$ = 2.25–3.00, r-m/dm-cu : dm-cu = 3.57–4.42. Haltere brown, knob usually darker.

*Abdomen*: All sclerites brown, more shining than thorax. Preabdominal terga broad and transverse, reaching lateral sides of abdomen, all sparsely and shortly setose. T2 partly (laterally) fused with T1 and shorter than T3. T3–T5 subequal in size. T6 weakly sclerotised, pale, reduced to small transverse, slightly asymmetrical sclerite. S1 and S2 small, narrower than S3. S3–S5 relatively broad and becoming somewhat wider posteriorly, S5 being the largest. Postabdominal sterna (S6–S8) asymmetrical, partly fused together and dark like preabdominal terga. S6 (situated ventrolaterally) transversely narrow ventrally and fused with S7 laterally, both short. S7 situated on left side of postabdomen; S8 long (longer than epandrium) and situated dorsally.

*Genitalia*: Epandrium (Figs 36, 37) moderately long, relatively shortly setose, including the longest dorsomedial setae. Anal opening large, rounded triangular. Cercus markedly enlarged, heavily sclerotised, brown, with laterally expanded and anteriorly bent ventral apex (Figs 36–37). Medandrium (Fig. 36) wide, medially short. Gonostylus (Figs 37, 40) proximally wide, in distal third strongly tapered and curved anterointernally and its apex with 2 blunt teeth (cf. Fig. 36); outer side of gonostylus with distinct micropubescence, inner side with scattered setae. Hypandrium not very robust, simple (Fig. 41), with reduced internal lobes; transandrium medioventrally simple, only lateral sides of basal membrane weakly sclerotised (in contrast to *Amygdalops* species), medially with hyaline transverse tubercles (Fig. 38). Pregonite (Fig. 41) largely fused with hypandrium and incurved, only its posterior part somewhat tuberculiform, with two groups of setae (1 anterior seta and 4 setae on posterior tubercle). Postgonite (Fig. 41) slender, slightly sinuous, apically acute and bearing 1 anterior seta in basal third; membrane attached internally to postgonite (= outer part of folding apparatus) dark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Figs 42–48. *Margdalops venustus* sp. n., male and female paratypes (S. Africa). 42. Male head and thorax, dorsal view. 43. Female postabdomen, dorsal view. 44. Female internal sclerites, ventral view. 45. Spermathecae. 46. Female genital chamber with internal sclerites, lateral view. 47. Female postabdomen, ventral view. 48. Male head, lateral view. Scales: Figs 42, 48 = 0.2 mm, others = 0.1 mm. For abbreviations see text.

striated. Aedeagal part of folding apparatus attached to base of phallapodeme (Fig. 39, afa) dorsally membranous and its wall with lenticular grains with spine-like apex; connecting sclerite (Fig. 39, cs) elongate, heavily sclerotised. Aedeagal complex (Fig. 39) with robust phallapodeme having asymmetrical bifurcate base. Aedeagus with short frame-like phallophore and large distiphallus composed of voluminous saccus and very slender twisted filum. Saccus largely membranous (only basally with a pair of dark sclerites) and armed with scattered tubercles and fine spines. Filum formed by 2 stripe-like sclerites, one overpassing the other at apex. Ejacapodeme small, with slender projection (Fig. 39).

Female differs from male as follows:

Total body length 1.94–2.46 mm.

Face darker than in male, particularly with darker brown medial stripe. $f_3$ posteroventrally with simple finely setulose armature. Wing measurements: length 1.86–2.31 mm, width 0.57–0.77 mm, $Cs_3 : Cs_4$ = 2.13–2.63, r-m/dm-cu : dm-cu = 3.12–4.12. Abdomen with transverse preabdominal terga. Preabdominal sterna (S1–S5) variable, ranging from narrow (S4 as long as broad) to as broad as in male (S4 wider than long).

Postabdomen (Figs 43, 47) relatively short and wide. T6 wide, posteriorly tapered, with short setae in posterior half. S6 wide, transverse, finely setose. T7 narrow, dorsomedially short because of anterior emargination, with dense short and thick setae. S7 longer than wide (Fig. 47), with a transverse dark stripe separating larger, lighter pigmented and setose posterior part from darker anterior third. T8 dark, transverse, semicircular, with fine setae. S8 dark, narrow, posteroventrally bulging, with deep narrow posteromedial incision. T10 small, rounded pentagonal, darker than cerci, microtomentose and with pair of longer setae. S10 slighty wider and paler than T10, with a row of setulae along posterior margin and microtomentose on disc. Internal sclerotisation of genital chamber complex (Figs 44, 46), composed of 2 pairs of crooked, partly coalesced sclerites and of an anterior faint ring-shaped twisted structure (Fig. 44). Ventral receptacle (Fig. 46) subcylindrical, weakly slerotised and proximally ringed, with apical vermicular projection. Accessory gland on ringed duct with terminal ball-shaped dilatation. Spermathecae 1+1 (Fig. 45) spherical, one larger than the other, with small tubercles on surface of basal half, and with narrow (compared to broad membranous duct) sclerotised cervix. Cercus (Fig. 43) comparatively short, pale pigmented, shortly setose.

Discussion: This species forms together with *M. bifilum* sp. n. and *M. caligatus* sp. n. the *M. venustus*-group, the monophyly of which is confirmed by 6 synapomorphies, viz., narrowed dm cell, dilated male cercus, modified gonostylus, basal sclerite of postgonite absent, connecting sclerite strongly sclerotised and cervix of spermatheca narrowed. *M. venustus* sp. n. can be easily recognised from other *Margdalops* species by its striking ornamentation of the frons with its medial velvety brown band, contrasting bicoloured antenna and distinctive male cercus, gonostylus and female S7 (see key). Other diagnostic features include peculiarites in the male aedeagal complex (e.g. basal fork of phallapodeme, setosity of postgonite, armature of saccus) and of the female postabdomen (e.g. transverse S6, internal sclerites, ventral receptacle).

Biology: Data associated with some specimens indicate that adults were bred from the nests of the widespread southern African Cape Robin (*Cossypha caffra*). However, the nest is likely to be only a secondary breeding habitat of the species, as the larvae were probably developing in the plant material used in the construction of the nests in question. Adults appear not to be seasonal and were collected from October to February, April and July.

Distribution: The species seems to be common in South Africa, and probably occurs also in Swaziland, Mozambique and Zimbabwe.

### **Margdalops bifilum** sp. n.

(Figs 49–54, 70)

Type material: Holotype male, labelled: 'KENYA, Kakamega Forest, 20–21.XI.1986, A. Freidberg' (TAUI, genit. prep.). Paratype: KENYA: same data as holotype, 1 male (somewhat damaged; TAUI, genit. prep.).

Etymology: The name refers to distinctly 'doubled' filum (composed of two band-like sclerites) of the distiphallus.

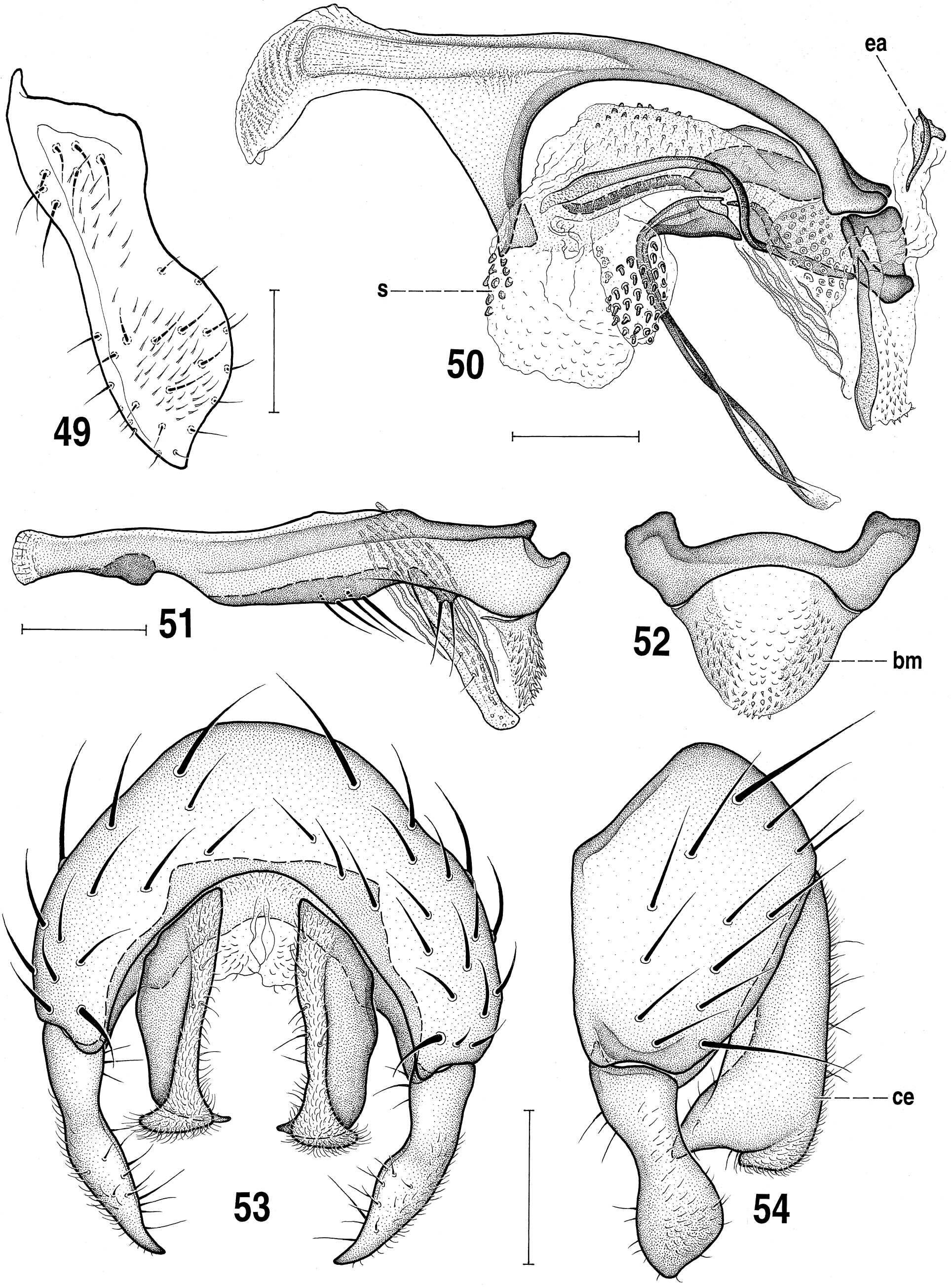
Description: Male.

Total body length 2.18–2.23 mm. Body brown and yellow.

*Head*: Slightly longer than high. Frons dark brown, only foremost part paler brown. Orbit brown, without micropubescence and shiny. Frontal triangle distinct, reaching anterior fourth of frons; its surface and stripes between it and orbits sparsely grey microtomentose; ocellar triangle relatively flat and shiny. Face almost uniformly ochreous brown. Gena pale brown with darker ventral margin, greyish microtomentose like face; postgena dark brown. Mouthparts brownish dorsally, ochreous yellow (including palpus) ventrally. Chaetotaxy: pvt short, with apices crossed; vte longest of cephalic setae; vti shorter than vte; oc distinctly shorter than vti; posterior ors almost as long as vte. Eye with longest diameter about 1.3 times as long as shortest one. Gena very narrow also posteriorly; its minimum depth less than 0.05 times as long as shortest eye diameter. Antenna entirely brown to ochreous brown; 1st flagellomere lightest (ochreous) ventrobasally; arista twice as long as antenna, with sparse long cilia.

*Thorax*: Brown except for yellow ventral portion. Mesonotum brown to dark brown, sparsely greyish microtomentose. Pleural part of thorax with a broad brown dorsal band, covering also most of mesopleuron and pteropleuron; remainder of pleura (including ventral margins of mesopleuron and pteropleuron) yellow. Chaetotaxy as in *M. venustus*, but hu, both npl and, particularly, prs shorter, and, on the contrary, both stpl longer. Scutellum relatively flat dorsally. Legs yellow, with femora and tibiae ochreous. Pedal chaetotaxies as in *M. venustus*, but $f_3$ with only 9–10 setae in posteroventral row, 4–5 of which are thickened. Wing (Fig. 70) similar to that of *M. venustus*, but more widened in distal fourth, $R_{4+5}$ and M less convergent apically, discal (dm) cell longer with r-m situated slightly anterior to its middle and $CuA_1$ more bent. Wing measurements: length 2.22–2.27 mm; width 0.63–0.65 mm, $Cs_3 : Cs_4$ = 3.00–3.20, r-m/dm-cu : dm-cu = 5.71–6.67. Haltere blackish brown, with brown stem.

*Abdomen*: Dark brown including sterna, only T6 unsclerotised, pale pigmented, small and transverse. T3–T5 large and long. Preabdominal sterna broader than those of *M. venustus*, pleural membrane reduced. S5 shorter than S4 and distinctly emarginate posteromedially. S6 shorter than in *M. venustus*, and its ventral projection very thin.



Figs 49–54. *Margdalops bifilum* sp. n., male paratype (Kenya). 49. Gonostylus, sublateral view (widest extension). 50. Aedeagal complex, lateral view. 51. Hypandrium and associated structures, lateral view. 52. Transandrium, caudal view. 53. External genitalia, caudal view. 54. Same, lateral view. Scales: Fig. 49 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

*Genitalia*: Epandrium (Figs 53, 54) medium long, longer setose than in *M. venustus*, with longest dorsomedial and ventrocaudal seta. Anal opening large, rounded triangular. Cercus very enlarged but laterally not expanded, with anteroventrally projecting apex and micropubescent posterior edge (Figs 53–54). Medandrium (Fig. 53) small, short. Gonostylus (Figs 49, 54) elongate, proximally and distally broader, in the middle tapered; apex angular (cf. Fig 49); its outer side with sparse micropubescence; inner side with scattered setae. Hypandrium relatively slender (Fig. 51); transandrium narrower than in *M. venustus*; lateral sides of basal membrane longer (Fig. 52) and its medial part with numerous spinulae. Pregonite (Fig. 51) with tuberculiform posterior part and two groups of setae (4–7 setae anteriorly and 2–3 setae on posterior tubercle). Postgonite (Fig. 51) slightly sinuous, broader, with blunt apex and 2–3 setulae (that in apical third longest); internal dark striated membrane as in *M. venustus*. Aedeagal part of folding apparatus with small lenticular tubercles; connecting sclerite (Fig. 50) elongate, slender, sclerotised. Aedeagal complex (Fig. 50) with phallapodeme more slender, with bifurcate base less asymmetrical and apex expanded ventrally. Saccus of distiphallus membranous, with basal sclerites larger than in *M. venustus*, with short dark blunt spines in 2 subapical groups besides fine setulae. Filum formed by 2 stripe-like sclerites, one longer and wider than other in flattened apex. Ejacapodeme small, with slender projection (Fig. 50).

Female unknown.

Discussion: *M. bifilum* sp. n. belongs to the *M. venustus*-group and is closest to *M. caligatus* sp. n; these species share a number of synapomorphies, viz. reduced silvery stripes on frons, long ventrocaudal seta on epandrium, reduced setae on posterior tubercle of postgonite, similar spines on saccus of distiphallus. *M. bifilum* differs from all congeners by the dark gena without silvery microtomentum, its very broad dorsal brown pleural band, the gonostylus narrowed in the middle, and the distinctive male cercus and finely spinose basal membrane (Fig. 52).

Biology: Both type specimens were caught in November.

Distribution: The species is only known from Kenya.

## **Margdalops caligatus** sp. n.

(Figs 55–65, 71)

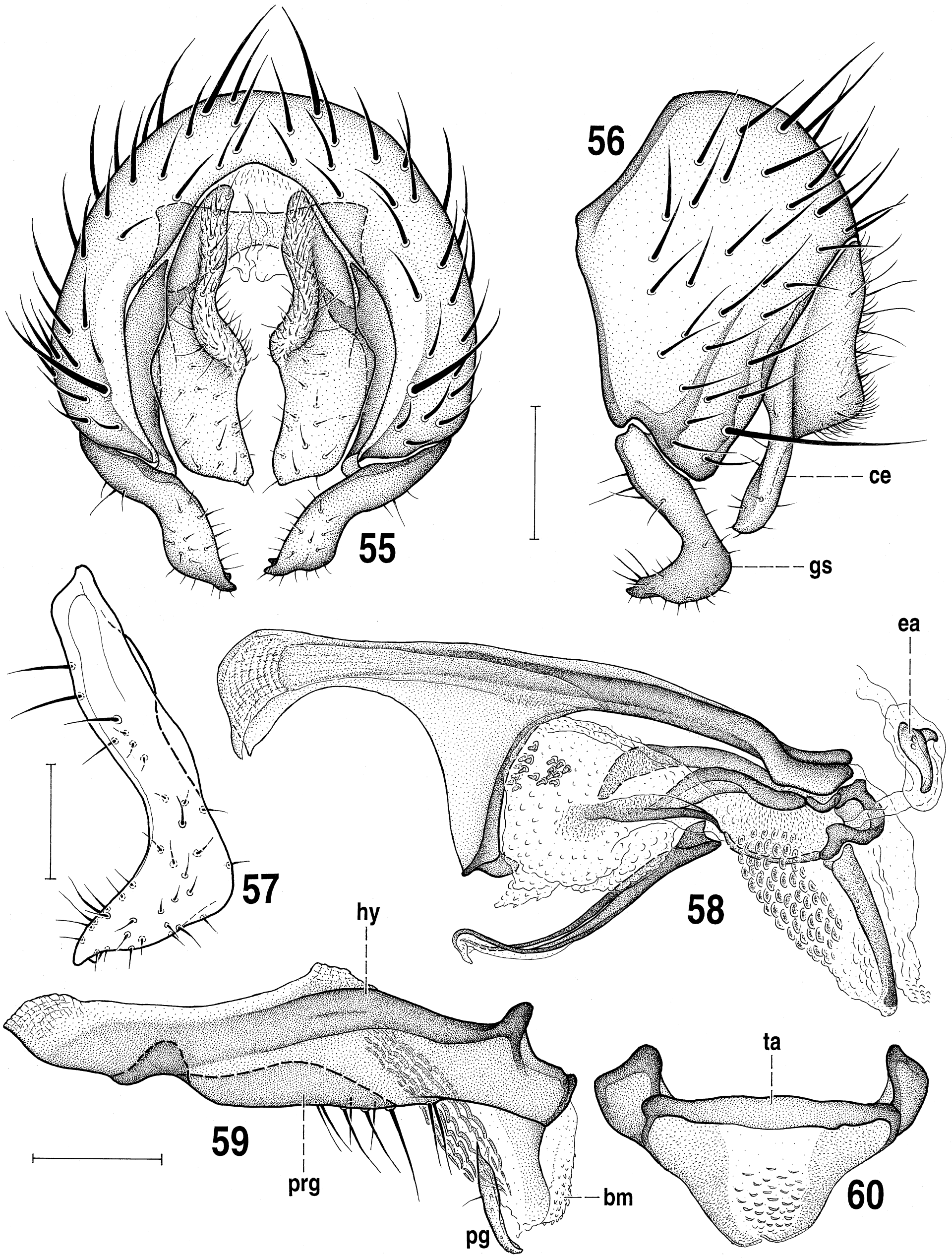
Type material: Holotype male, labelled: 'KENYA, 20 km S Kapsabet, 10.V.1991, A. Freidberg & Fini Kaplan' (TAUI, genit. prep.). Paratypes: KENYA: 2 males 3 females, same data as holotype; 2 females, Mt. ElgonLodge, Malaise trap, 1–6.xi.1983, A. Freidberg (TAUI, 1 male 1 female SMOC; all with genit. prep.).

Etymology: The name is derived from '*caliga*' (L. = boot), referring to the boot-like shape of the male gonostylus.

Description: Male.

Total body length 2.14–2.38 mm. Body brown and pale yellow.

*Head*: As long as high or somewhat longer than high. Frons pattern as in *M. bifilum*, generally brown but its anterior fourth yellowish ochreous. Orbit brown, very sparsely microtomentose, mostly bare and shiny. Frontal triangle reaching to anterior fourth of frons; sparsely grey microtomentose (except bare ocellar triangle) as are the impressed



Figs 55–60. *Margdalops caligatus* sp. n., male paratype (Kenya). 55. External genitalia, caudal view. 56. Same, lateral view. 57. Gonostylus, sublateral view (widest extension). 58. Aedeagal complex, lateral view. 59. Hypandrium and associated structures, lateral view. 60. Transandrium, caudal view. Scales: Fig. 57 = 0.05 mm, others = 0.1 mm. For abbreviations see text.

and darker brown striae separating frontal triangle and orbit. Face pale to whitish yellow. Gena white and silvery microtomentose, with narrow brown ventral margin; postgena yellowish white. Mouthparts yellow, palpus whitish yellow. Chaetotaxy as in *M. venustus*, but pvt crossed; vti long, with apices meeting or crossed medially; oc slightly shorter than vti; 1 (more rarely 2) microsetulae in front of frontal triangle; subvibrissa distinctly weaker and shorter (half length of vi). Eye with longest diameter 1.4–1.5 times as long as shortest one. Gena slightly widened posteriorly; its minimum depth 0.05 times as long as shortest eye diameter. Antenna with ochreous scape and pedicel; 1st flagellomere dirty yellow to ochreous around base of arista to whitish yellow on apex; arista about 1.8 times as long as antenna, long ciliate.

*Thorax*: Brown dorsally, pale yellow ventrally. Mesonotum brown, with sparse microtomentum being white between dorsocentral lines in front of suture (only visible in very oblique lighting), dark grey laterally. Humeral and notopleural areas lighter brown. Pleura with brown dorsal band narrower than that of *M. bifilum*, otherwise yellow. Chaetotaxy as in *M. venustus*, but prs slightly shorter, pa distinctly longer and medial rows of ac microsetae reaching to posterior dc. Scutellum relatively flat dorsally. Legs yellow, femora and tibiae somewhat darker. Pedal chaetotaxies as in *M. venustus*; $f_3$ with 13–14 setae in posteroventral row, 3–4 of them short and thicker than others. Wing (Fig. 71) similar as in *M. venustus*, but marginal band shorter, $R_{4+5}$ less sinuate and apically subparallel to M, r-m situated anterior to middle of narrow dm cell and $CuA_1$ longer. Wing measurements: length 2.04–2.26 mm; width 0.61–0.66 mm, $Cs_3 : Cs_4$ = 2.37–2.94, r-m/dm-cu : dm-cu = 5.00–5.57. Haltere brown, with darker knob.

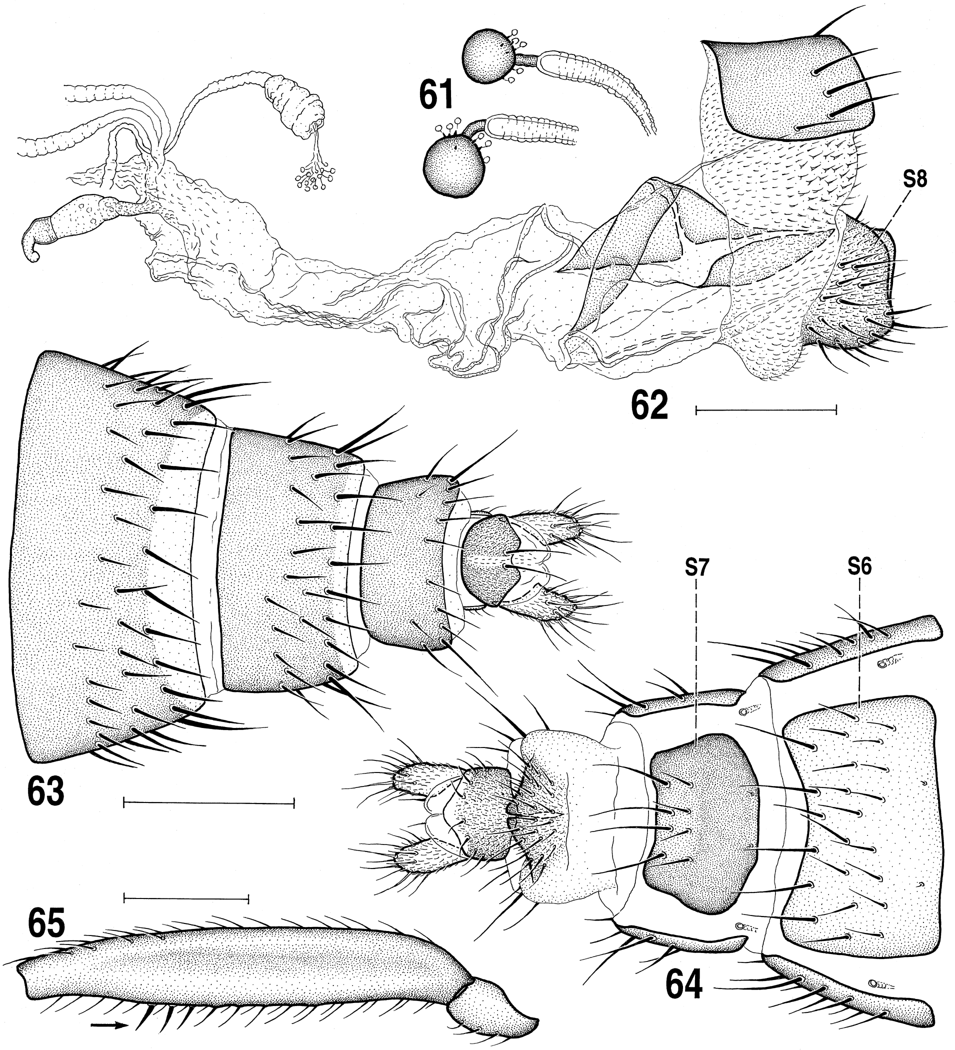
*Abdomen*: With dark brown sclerites; preabdominal terga and sterna large and pleural membrane relatively narrow, as in *M. bifilum*. S3 and S4 largest of sterna, both as long as wide. S5 distinctly shorter and wider than S4, posteromedially emarginate. T6, S6–S8 also similar to those of *M. bifilum*.

*Genitalia*: Epandrium (Figs 55, 56) moderately long, very densely setose, with 1 longer dorsomedial seta and 1 very long ventrocaudal seta. Anal opening large, suboval. Cercus large and unusually shaped, with frontocaudally flattened anteroventral part and ridge-like posteriorly projecting dorsal part (Figs 55, 56). Medandrium (Fig. 55) wide, very short medially. Gonostylus (Figs 56, 57) boot-shaped in profile, with 2 blunt teeth on apex (cf. Fig. 55); its outer side with a few setulae but without micropubescence; inner side sparsely setose. Hypandrium relatively robust (Fig. 59); transandrium straight (Fig. 60); lateral sides and medial armature of basal membrane as in *M. venustus*. Pregonite (Fig. 59) with simple posterior part and 2 groups of setae (6–7 in anterior and 2 in posterior group). Postgonite (Fig. 59) small, slender, slightly bent, apically not very acute, with about 3 setulae, that in basal third longer; membrane attached internally to postgonite dark wavy striated. Aedeagal part of folding apparatus with dark lenticular tubercles; connecting sclerite (Fig. 58) elongate, darker apically. Aedeagal complex (Fig. 58) with robust phallapodeme having deeply bifurcate base. Saccus smaller than in *M. venustus*, membranous except for a pair of basal sclerites, with fine scattered tubercles and/or spinulae and a group of dark blunt spines near its middle. Filum shorter than in *M. venustus* and *M. bifilum*, formed by 2 stripe-like, basally fused sclerites, one longer and ending in curved apex. Ejacapodeme small, with slender projection (Fig. 58).

Female differs from male as follows:

Total body length 2.30–2.70 mm.

Anterior fourth of frons and face darker, ochreous brown. Gena yellow and antenna ochreous with 1st flagellomere somewhat darker. f$_3$ with a posteroventral row of setae but only 2–3 of them thickened (cf. Fig. 65). Wing measurements: length 2.18–2.86 mm; width 0.65–0.85 mm, Cs$_3$ : Cs$_4$ = 2.26–2.72, r-m/dm-cu : dm-cu = 4.40–5.62. Abdomen with preabdominal terga more transverse. S2 shorter than S3–S5, which are subequal in length and become slightly wider posteriorly, S5 being the largest.



Figs 61–65. *Margdalops caligatus* sp. n., female paratype (Kenya). 61. Spermathecae. 62. Genital chamber with internal sclerites + 8th abdominal segment, lateral view. 63. Female postabdomen, dorsal view. 64. Same, ventral view. 65. f$_3$, posterior view. Scales: Figs 61, 62 = 0.1 mm, others = 0.2 mm. For abbreviations see text.

Postabdomen (Figs 63, 64) slighty longer than in *M. venustus*. T6 wide, posteriorly somewhat tapered, with short setae in front of unpigmented posterior margin. S6 wide, shorter and wider than S5, finely setose, emarginate posteromedially and lighter than S7. T7 narrow, but not emarginate anteriorly, with short and thick setae. S7 broader than long (Fig. 64), posteriorly tapered, with rounded corners, very darkly pigmented and with a few fine setae (those in posterior row long). T8 dark, transverse, slightly wider posteriorly and with fine setae. S8 small, dark, with poorly delimited lateral margins. T10 small, rounded pentagonal, dark, with pale medial stripe (Fig. 63). S10 slighty wider and paler than T10. Internal sclerotisation of genital chamber (Fig. 62) composed of 3 pairs of twisted, more or less fused sclerites and of anterior faint ring-shaped, several times bent, structure. Ventral receptacle (Fig. 62) cup-like, weakly sclerotised and terminating in apical finger-like projection. Accessory gland with terminally clavate duct. Spermathecae 1+1 (Fig. 61) spherical, subequal in size, with a few minute spinulae near base and narrow (sometimes bent) sclerotised cervix. Cercus (Fig. 63) longer and with longer setae than in *M. venustus*, pale pigmented.

Discussion: The new species forms a sister-group with *M. bifilum* sp. n. (see above). It resembles externally the latter species (see key), but differs in having a pale, silvery microtomentose gena and a narrower dorsal pleural band in addition to numerous features in the male genitalia (epandrium densely setose; distinctive male cercus; boot-like gonostylus; shortened filum of distiphallus) and the female postabdomen (S7 short, dark, with rounded corners; T10 dark, with medial light stripe) distinguishing it also from other *Margdalops* species. In contrast to other species treated here, the female of *M. caligatus* has some thickened short setae in a posteroventral row on $f_{3,}$ but this feature also occurs in an unnamed species of the *M. angustus*-group from Kenya.

Biology: Adults were collected in May and June, with two females from a malaise trap.

Distribution: The species is known only from Kenya.

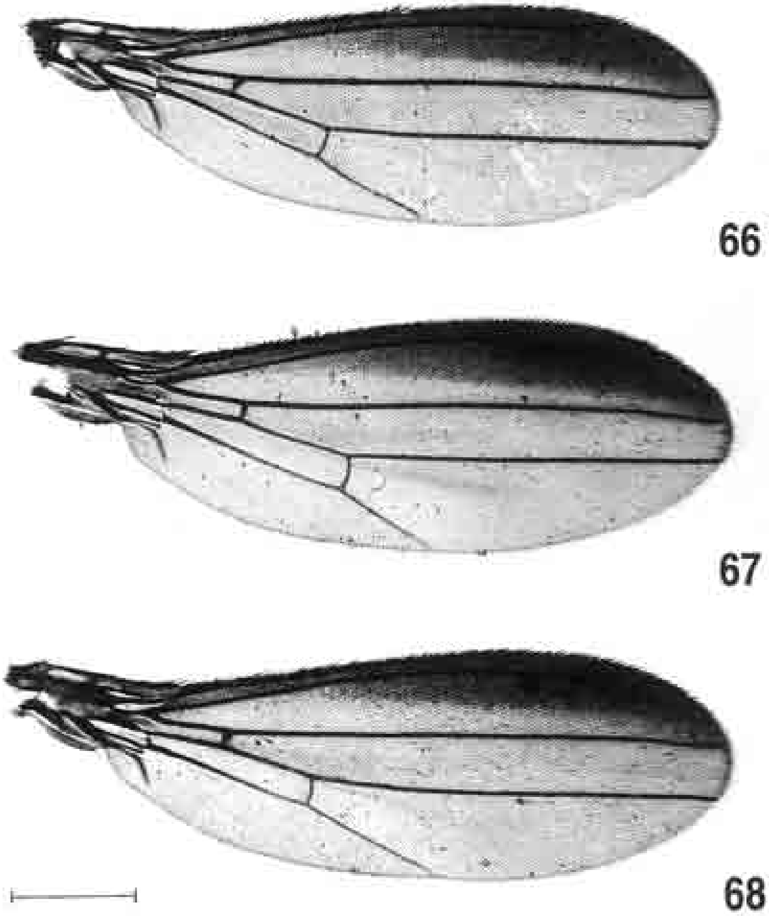
## NOTES ON PHYLOGENY AND BIOGEOGRAPHY

Cladistic analysis (refer to Appendix 1 for listing of characters) was used to resolve the relationships of *Margdalops* species studied. *Amygdalops* Lamb, 1914, was found to be the sister-group of *Margdalops* gen. n.; the clade with this grouping is supported by 7 synapomorphies (see Fig. 72, characters 1–7). One of these character states, viz. 5 – additional sclerite of the postgonite, was subsequently lost in the *Margdalops venustus*-group. The monophyly of the genus *Amygdalops* is supported by 9 apomorphies relative to only 6 synapomorphies uniting *Margdalops* species (cf. Fig. 72). The brown margined wing of *Margdalops* [character 19] is considered to be apomorphic and the unpatterned wing plesiomorphic, which, however, only occurs in the most primitive species of *Amygdalops* (*A. trivittatus* Frey, 1958), while more advanced groups of *Amygdalops* have the wing ornamented (at least with a subapical spot), although never with a brown band along the anterior margin (cf. Roháček, in press).

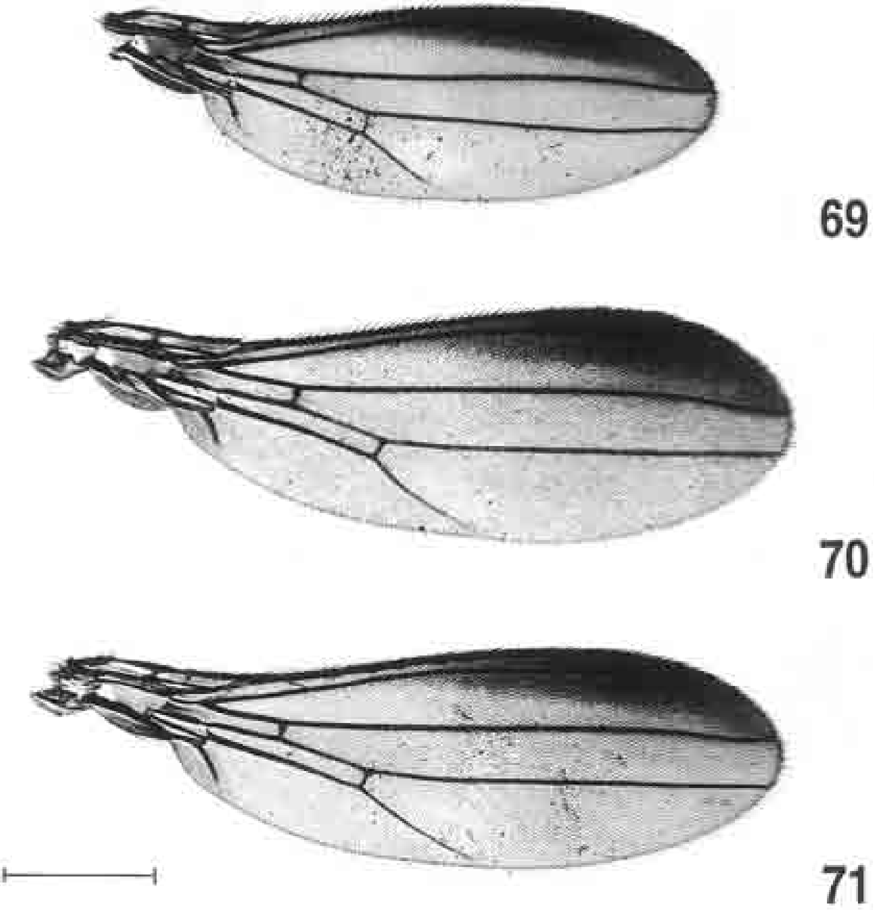
The *Margdalops* species treated in this paper are divided into two well supported clades, one being the *M. angustus*-group [synapomorphies 23–26], the other the

*M. venustus*-group [synapomorphies 27–32]. The *M. angustus*-group is considered to be more primitive, because species have more plesiomorphies and some species have less modified external male genitalia (*M. microcercus* sp. n. in particular, see discussion under that species). The three species forming this group are retained in an unresolved trichotomy (owing to difficulties with the polarity determination), because no unambiguous synapomorphy has been revealed to demonstrate the sister-group relationships of any of the species. In the other clade (formed by the *M. venustus*-group) *M. venustus* sp. n. was found to be the sister-group of the remaining sister-pair formed by *M. bifilum* sp. n. and *M. caligatus* sp. n., although the monophyly of the latter group is not very strongly supported [cf. characters 33-36].

Presently, the genus *Margdalops* is only known from Africa. Despite the fact that all species described above are recorded only from South Africa, Kenya and Uganda, the



Figs 66–68. Wings of *Margdalops* species. 66. *M. microcercus* sp. n., female paratype (Kenya). 67. *M. angustus* sp. n., female pararype (S. Africa). 68. *M. signatus* sp. n., female paratype (Kenya). Scale = 0.5 mm.



Figs 69–71. Wings of *Margdalops* species. 69. *M. venustus* sp. n., male paratype (S. Africa), 70. *M. bifilum* sp. n., male paratype (Kenya), 71. *M. caligatus* sp. n., male paratype (Kenya). Scale = 0.5 mm.

genus probably is more widespread in the continent because further unnamed species were found to occur in Tanzania (2 females of an unusually large species in TAUI) and even in Nigeria (2 damaged males of a species of the *M. angustus*-group in NMWC). In Kenya 5 species of *Margdalops* were found (*M. microcercus, M. signatus, M. bifilum, M. caligatus* spp. n., plus 1 unnamed species) belonging to both species-groups. The two species known from South Africa (*M. angustus, M. venustus* spp.n.) also belong to the different species-groups. However, no more than 2 species have been collected from a single locality.

*Margdalops* appears to be associated mainly with indigenous forest in tropical Africa. In South Africa, its known distribution is predominantly in the warm, moist, eastern part of the country, which has rainfall in summer. The genus is, however, also recorded from cooler areas (Western Cape), as far west as Mossel Bay. Both South African species are recorded from a range of altitudes, including a variety of coastal habitats and montane areas (usually with afromontane forest).

## ACKNOWLEDGEMENTS

For the kind loan of anthomyzid material for this revision we should like to thank the curators Dr. J. Chainey (BMNH), Dr. J. C. Deeming (NMWC), Dr. A. Freidberg (TAUI), Dr. D. K. McAlpine and Mr. B. J. Day (AMSA). This study was financially supported by grant No. 206/03/0020 of the Grant Agency of the Czech Republic (J. Roháček).

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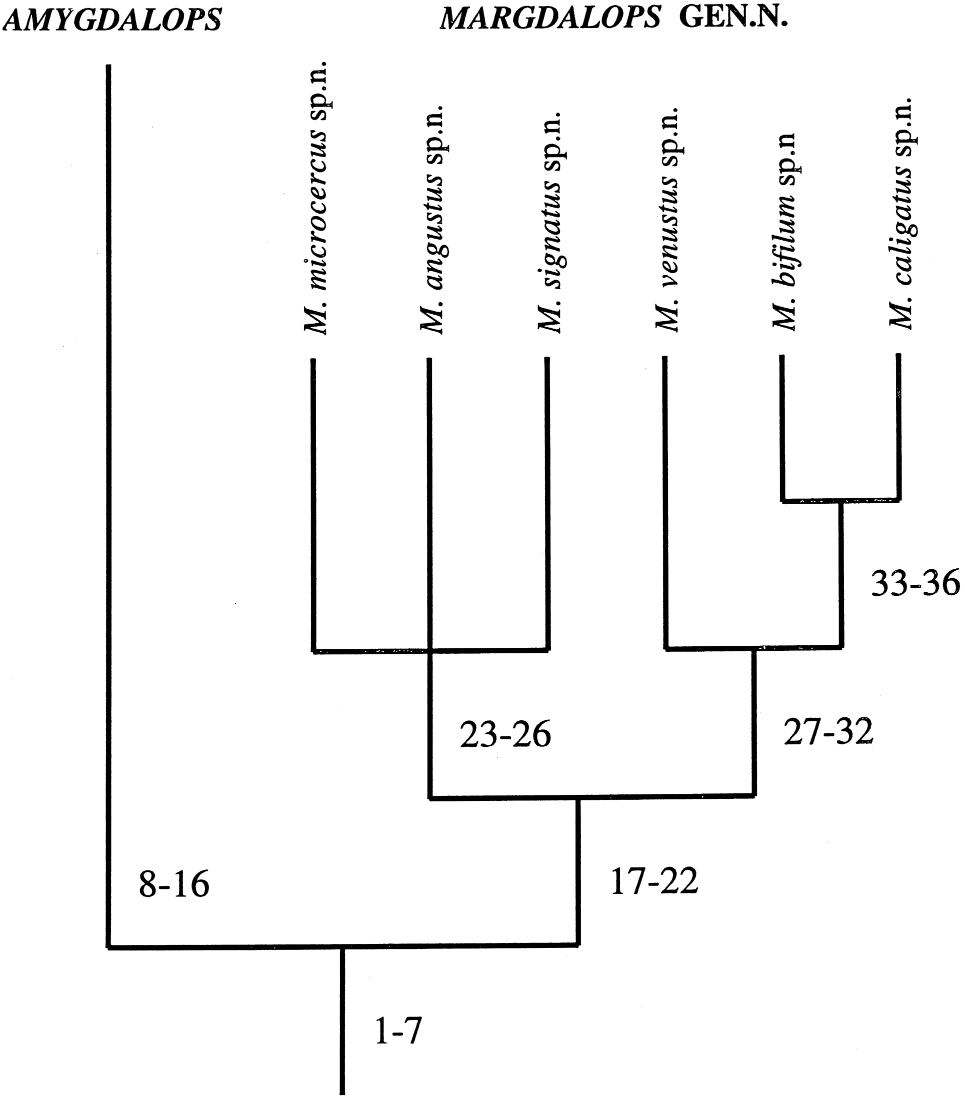
*AMYGDALOPS*
*MARGDALOPS* GEN.N.
*M. microcercus* sp.n.
*M. angustus* sp.n.
*M. signatus* sp.n.
*M. venustus* sp.n.
*M. bifilum* sp.n
*M. caligatus* sp.n.
33-36
23-26
27-32
8-16
17-22
1-7

Fig. 72. Cladogram showing the inferred relationships of species of *Margdalops* gen. n.

### Characters used in the cladogram (apomorphic state - A, plesiomorphic state - P):

**1.** Eye ellipsoid to ovoid, with longest diameter oblique (A) - eye subcircular, with diameter more perpendicular (P).
**2.** Occiput strongly concave (A) - occiput not concave (P).
**3.** 2 long ors, the posterior in the middle, the anterior at fore margin of frons (A) - long ors situated more posteriorly (P).
**4.** Anal (cup) cell very narrow (A) - anal cell broader (P).
**5.** Postgonite with additional sclerite attached to its base (A) - postgonite without additional sclerite (P).
**6.** Female S8 small, protruding posteroventrally and with narrow posteromedial incision (A) - female S8 unmodified (P).
**7.** Ventral receptacle with digitiform or vermicular projection (A) - ventral receptacle apically simple (P).
**8.** Frontal lunule reduced (A) - frontal lunule distinct (P).
**9.** vti markedly shorter than vte (A) - vti at most slightly shorter (usually as long as) vte (P).
**10.** Arista long pectinate (A) - arista never pectinate (P).
**11.** prs small, reduced (A) - prs long (P).
**12.** $CuA_1$ shortened (A) - $CuA_1$ longer (P).
**13.** Transandrium medially with paired caudal process (A) - transandrium medially simple (P).
**14.** Pregonite separated from hypandrium by posterior notch (A) - pregonite fused with hypandrium also posteriorly
**15.** Aedeagal part of folding apparatus proximally sclerotised (A) - aedeagal part of folding apparatus membranous (P).
**16.** Female S7 variously modified (A) - female S7 relatively simple (P).
**17.** Occiput (and often frons) with a pair of silvery microtomentose stripes (A) - occiput and frons without silvery microtomentose stripes (P).
**18.** dc situated more anteriorly and anterior dc strong (A) - dc inserted more posteriorly and anterior dc small (P).
**19.** Wing with dark band along anterior margin (A) - wing without dark band along anterior margin (P).
**20.** dm cell short and narrow (A) - dm cell longer, widened posteriorly (P).
**21.** Medandrium broad and medially shortened (A) - medandrium narrow and high (long) (P).
**22.** Male cercus heavily sclerotised and usually enlarged (A) - male cercus small, weakly sclerotised (P).
**23.** Ejacapodeme enlarged (A) - ejacapodeme small (P).
**24.** Distiphallus with paired sclerites coalesced and provided with processes (A) - distiphallus with separate simple, paired band-like sclerites (P).
**25.** Female cercus shortened and dark (A) - female cercus longer and pigmented (P).
**26.** Ring-shaped sclerite in female genital chamber well developed (A) - ring-shaped sclerite tenuous and twisted (P).
**27.** dm cell very narrow (A) - dm cell less narrow (P).
**28.** Male cercus robust, strongly enlarged (A) - male cercus smaller, slender (P).
**29.** Gonostylus modified (A) - gonostylus simple, elongate (P).
**30.** Additional sclerite of postgonite absent (A) - additional sclerite of postgonite present (P).
**31.** Connecting sclerite sclerotised and dark (A) - connecting sclerite membranous, pale (P).
**32.** Cervix of spermatheca narrowed (A) - cervix of spermatheca broader (P).
**33.** Silvery strips on frons reduced or absent (A) - silvery strips on frons well developed (P).
**34.** Epandrium with 1 long ventrocaudal seta (A) - epandrium without long ventrocaudal seta (P).
**35.** 2 setae on posterior tubercle of postgonite (A) - 4 setae on posterior tubercle (P).
**36.** Saccus with blunt dark spines on basal tubercles (A) - saccus without such spines (P).